m Library
Wilson Ornithological Club
DEC 3 '52
UNIVERSITY
OF MICHIGAN
DEC 9 1952
MUSEUMS
LIBRARY

THE CONDOR

Volume 54 November-December, 1952 Number 6

JOURNAL OF THE COOPER ORNITHOLOGICAL CLUB

THE CONDOR

JOURNAL OF THE COOPER ORNITHOLOGICAL CLUB

Published bi-monthly at Berkeley, California. Entered as second-class matter at the post office at Berkeley, California, May 15, 1925, under Act of Congress of March 3, 1879. Issued from the office of THE CONDOR, Museum of Vertebrate Zoology, Berkeley 4, California.

SUBSCRIPTION RATES

Subscription price to non-members, five dollars per volume, payable in advance. Single copies, one dollar each.

MEMBERSHIP DUES

Active members, four dollars per year in the United States, of which $3.00 is for a year's subscription to The Condor; four dollars and twenty-five cents per year in all other countries in the International Postal Union.

Sustaining members, five dollars per year.

The life membership fee is one hundred dollars. No additional dues are required. The money is invested and the interest only is used for Club publications. Life members receive THE CONDOR without additional charge.

Send dues, subscriptions and notices of change of address to JACK C. VON BLOEKER, JR.

Send orders for back numbers of THE CONDOR and the PACIFIC COAST AVIFAUNA series to THOMAS R. HOWELL.

MANUSCRIPTS

Send manuscripts for publication to the Editor, ALDEN H. MILLER, Museum of Vertebrate Zoology, Berkeley 4, California, or to the Associate Editor, FRANK A. PITELKA, same address. Refer to suggestions on preparation of manuscripts for THE CONDOR on the back cover of recent issues of the journal.

Issued November 25, 1952

CONTENTS

White-winged Dove (*Zenaida asiatica*), a painting by Andrew Jackson Grayson ..... opposite 325
Altitudinal Hybridization in New Guinea Honeyeaters ..... *Ernst Mayr* and *E. Thomas Gilliard* 325
Starlings as Winter Residents in the Uinta Basin, Utah ..... *Merlin L. Killpack* and *Don N. Crittenden* 338
Winter Bird Census at Xilitla, San Luis Potosí, México ..... *L. Irby Davis* 345
Taxonomic Status of the Bank Swallow of North America ..... *Samuel A. Arny* 356

FROM FIELD AND STUDY
Supplementary Bird Records for Nevada ..... *Ned K. Johnson* and *Frank Richardson* 358
Two Nestling Robins with Abnormal Beaks ..... *James Hodges* 359
Notes on *Bonasa* and *Numenius* in Alaska ..... *Ira N. Gabrielson* 359
Inland Record of Sanderling ..... *Paul E. Steel* 359
A Hawk Owl Bathing with Snow ..... *Tom J. Cade* 360
Black-crowned Night Heron Breeds in Heart of Mexico City ..... *Guillermo José Tapia* 360
Winter Status of Swallows in California ..... *Fred G. Evenden, Jr.* 360
The Incubation Patch of the Clark Nutcracker ..... *L. R. Mewaldt* 361
Audible Flight of Great Horned Owls ..... *Wendell Taber* 361
Additional Comments on Philippine Birds and a New Record from the Archipelago ..... *S. Dillon Ripley* 362
The Harlan Hawk in the Cariboo District, British Columbia ..... *Leo Jobin* 362
Song in Hand-raised Meadowlarks ..... *Margaret M. Nice* 362
The Influence of Food Abundance on the Over-wintering of Pine Grosbeaks at College, Alaska ..... *Tom J. Cade* 363
Porcupine Quill Fatal to Jay ..... *Homer V. Griffin* 364

NOTES AND NEWS 365

PUBLICATIONS REVIEWED
The Birds of Crater Lake National Park, by Donald S. Farner ..... *Alden H. Miller* 365

COOPER CLUB MEETINGS 366

INDEX TO VOLUME 54 367

WHITE-WINGED DOVE

ZENAIDA ASIATICA

One-half natural size

Painting by Andrew Jackson Grayson

THE CONDOR

VOLUME 54 NOVEMBER-DECEMBER, 1952 NUMBER 6

ALTITUDINAL HYBRIDIZATION IN NEW GUINEA HONEYEATERS

By ERNST MAYR and E. THOMAS GILLIARD

The evolutionary significance of hybridization in nature is still in dispute. It is evident that there are pronounced differences between animals and plants with respect to the frequency of hybridization, and that even within the animal kingdom there is considerable variation in the nature and frequency of hybridization. A full understanding cannot be expected until more cases of hybridization have been analyzed. The discussion of an unusual case of hybridization in a group of New Guinea honeyeaters is the object of the present contribution.

The mountain honeyeaters, which in the recent ornithological literature are combined in the superspecies *Melidectes leucostephes*, were originally described as four separate species. These belong to two rather distinct types which we might refer to as "wattle-birds" and "black-bills" (fig. 1, table 1). These two types are so different from each other that in the past they were sometimes placed in different genera, *Melidectes* and *Melirrhophetes*. The black-bills are rather uniform throughout their essentially continuous range; the wattle-birds are more variable (table 2). Ignoring for the time being the characters of the more isolated populations of wattle-birds (*leucostephes, foersteri*), the essential differences between black-bills and wattle-birds are summarized in table 1.

Table 1

Essential Differences between Black-bills (*belfordi*) and Wattle-birds (*rufocrissalis*)

Character	Black-bills	Wattle-birds
Bill (color)	black	gray
Bill (size)	short	long
Forehead	black	white
Gape wattle	small	large
Throat wattle	absent	large
Superciliary	white	yellow
Vertical range	higher	lower

The black-bills are restricted to the high mountains of the central ranges of the main portion of New Guinea from the Weyland Mountains (subspecies *joiceyi*) in the west to the mountains of southeastern New Guinea (subspecies *brassi*) in the east (Mayr, 1941). Variation within this area is limited on the whole to size and to the tints of gray and olive.

The wattle-birds are found on more or less isolated mountain ranges north of the central chain: the Arfak Mountains on the Vogelkop (*leucostephes*), Schraderberg in the Sepik Mountains (*rufocrissalis*), and the Saruwaged Mountains in the Huon Peninsula (*foersteri*) (fig. 2). The three forms are so different from each other that they were originally described as three separate species, and indeed *leucostephes* is sufficiently aberrant in its coloration to be still treated as a species. The differences between these three major types of wattle-birds are listed in table 2 in comparison with the characters of *brassi*.

All the populations of wattle-birds and black-bills are allopatric, and after a gray-billed "black-bill" (*griseirostris*) had been discovered on Mount Goliath (Oranje Mountains) it was proposed by Stresemann (1923) to consider all these forms, except *leucostephes*, as conspecific. This arrangement has been followed by most recent authors.

Since 1923 other populations have been found in east-central New Guinea which

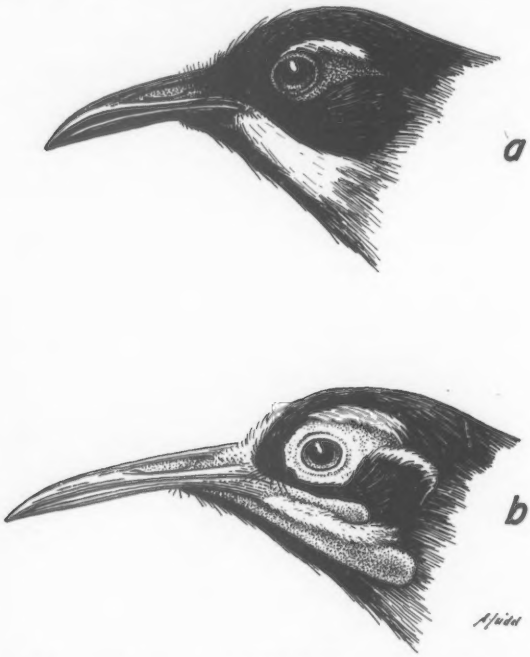

Fig. 1. Differences between a typical "black-bill" (*a*) and a typical "wattle-bird" (*b*). *a* = *Melidectes belfordi belfordi*; *b* = *M. b. rufocrissalis*.

provide additional confirmation for the assumption that black-bills and wattle-birds are not reproductively isolated. In 1929 Mayr found a new subspecies (*stresemanni*) in the Herzog Mountains which by its variability has all the earmarks of a hybrid population between wattle-birds of the *rufocrissalis* type and black-bills. E. T. Gilliard found

Table 2

Differences between the Three Major Types of Wattle-birds and a Black-bill (*brassi*)

	White on forehead	Wing	Bill	Nape and chest	Edges of feathers on back	Superciliaries and ear spots	Under tail coverts
leucostephes	extensive	short	medium	black	white	white	buff
foersteri	small area	very long	short	dark gray	white on upper back	white	ochre
rufocrissalis	rather extensive	medium	long	ash gray	pale gray	yellow	rufous
brassi	absent	medium	medium	ash gray	gray	white	rufous

evidence for hybridization in every sample collected by him in 1950 in the Hagen, Wahgi, and Wilhelm mountains. It is thus evident that wattle-birds and black-bills hybridize along the broad front between the Oranje Mountains (Mt. Goliath) and the Herzog Mountains, wherever they have come into contact (fig. 2).

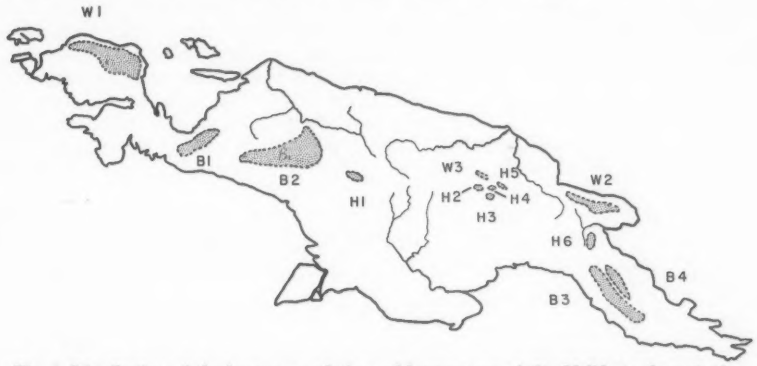

Fig. 2. Distribution of the known populations of honeyeaters of the *Melidectes leucostephes-belfordi* group. W = wattle birds; W_1 = *M. leucostephes* (Arfak Mts.); W_2 = *M. b. foersteri* (Saruwaged Mts.); W_3 = *M. b. rufocrissalis* (Schraderburg, Sepik Mts.). B = black-bills; B_1 = *M. b. joiceyi* (Weyland Mts.); B_2 = *M. b. kinneari* (Nassau, Oranje Mts.); B_3 = *M. b. brassi* (southeast New Guinea, low altitudes); B_4 = *M. b. belfordi* (southeast New Guinea, high altitudes). H = hybrid populations; H_1 = Mt. Goliath (*griseirostris*); H_2 = Mt. Hagen; H_3 = Mt. Kubor; H_4 = Wahgi Mts.; H_5 = Bismarck Mts.; H_6 = Herzog Mts. (*stresemanni*).

HYBRID INDEX

It has become customary within the last twenty-five years to express degrees of hybridity quantitatively. Following a suggestion made independently by various authors, perhaps first by Meise (1936), it is convenient to tabulate a hybrid index in such a manner that a typical individual of one parental strain scores 0, and a typical individual of the other parental strain 100. Nine differences between black-bills and wattle-birds were selected and given values, ranging from zero in the black-bills according to their importance up to 5, 10, 15, or 20 in the wattle-birds. The proper selection and scoring of these characters was by no means simple because some of them are affected by age, sex, season, and preservation. Still, we believe that our quantitative approach permits a more precise recording of the differences between the populations and of the hybridity of individual specimens than any other, more subjective method. The nine characters used are the following:

A. *Throat wattle* (0–15 points). Absence of a wattle is scored as zero, a large wattle as 15. Errors are introduced by the fact that females and immatures have on the average smaller wattles. Also, the wattles tend to shrivel up in dried skins which makes the scoring more difficult. Birds from the Lake Habbema region (*kinneari*) and from southeast New Guinea are almost consistently zero on this character. The Mount Goliath "black-bills" include several birds scoring "1" and one female scoring 7. The Schraderberg series, which theoretically should be 15, has: males, 10–15 (14.0) and females, 5–15 (9.1).

B. *Gape wattle* (0–10 points). Variability here is similar to that in the throat wattle.

C. *Naked area around eye* (0–5 points). This area is largely feathered in black-bills (0) and extensively naked in wattle-birds (5). Whatever naked area there is in black-bills is blue in life. The naked area in wattle-birds often appears yellow in the dried skin.

D. *Color of superciliary* (0–15 points). A white superciliary is scored 0; a bright lemon yellow superciliary is scored 15. All birds from Schraderberg score 15 on this character except one with 13.

E. *Color of posterior ear coverts* (0–5 points). White coverts are scored 0, yellow coverts 5.

F. *Color of forehead* (0–20 points). The forehead is black (0) in typical black-bills, extensively white (20) in wattle-birds. The feathers of the forehead in some specimens are completely coated by a mixture of nectar and pollen, which makes the scoring of such birds difficult.

G. *Bill-wing ratio* (0–15 points). Birds in which the bill is less than 27.7 per cent of the wing are scored 0; birds in which the bill is more than 33.3 per cent are scored 15. The correlation between this ratio and the apparent degree of hybridity is by no means perfect, but closer than either wing length or bill size alone.

H. *Color of bill* (0–10 points). A black bill is scored 0, a gray bill 10. In intermediate specimens the method of preservation sometimes seems to have affected the amount of grayness.

I. *Feathering at base of maxilla* (0–5 points). In black-bills the area between gape and nostrils is usually fully feathered (0); in wattle-birds it is often largely bare (5).

For the purpose of scoring, all birds were laid out in a single series in the sequence in which they showed the expression of a given character. The labels were not consulted and the specimens recorded until all specimens had been classified. This procedure was repeated for each character.

THE ANALYSIS OF POPULATIONS

BLACK-BILLS

(1) *kinneari* (Lake Habbema-Idenburg River) (B_2 on map).

Hybrid index—males, 2, 3, 8; females, 5, 9, 10.

The slight deviation from 0 is almost entirely contributed by the bill-wing ratio (G), namely 24 of the total 37 points in the six specimens. There is no indication in this population of the presence of wattle-bird genes.

(2) *brassi* (Mt. Tafa, Angabunga River, southeast New Guinea) (B_3 on map).

Hybrid index—males, 3, 4, 10; females, 1, 4, 4.

The slight deviation from a theoretical zero value is no indication of hybridism.

WATTLE-BIRDS

rufocrissalis (Schraderberg, Sepik Mountains) (W_3 on map).

Hybrid index—males, 87, 89, 90, 90, 96, 96, 100; females, 81, 83, 84, 85, 86, 88, 98; median, 88.5.

The material is in part poorly prepared and difficult to score. There is no evidence that the deviations from a theoretical 100 score are due to gene flow from black-bill populations.

HYBRID POPULATIONS

(1) *griseirostris* (Mount Goliath) (H_1 on map).

Hybrid index—males, 30, 32, 35, 35, 36; females, 21, 38; median, 35.

The index shows a distinct influence of wattle-bird genes not only in the gray bill but also in the development of the wattles, the bare areas on the bill and around the eye, and occasional indications of yellow in superciliary and ear coverts.

(2) Mount Hagen (2500-3500 meters), collected by E. T. Gilliard (H_2 on map).

Hybrid index—males, 7, 9, 31; females, 7, 9, 9, 10, 54; median, 9.

This is a very interesting series. Six of eight specimens are virtually pure black-bills, two others are hybrids, one even closer to the wattle-birds than to the black-bills.

(3) Mount Kubor (? 1800 meters), collected by E. T. Gilliard (H_3 on map).

Hybrid index—female, 76.

Closer to the wattle-birds but with evident gene flow from the black-bills, leading to reduction of gape and throat wattle.

(4) Mount Wilhelm, Bismarck Mountains (2900-3300 meters), collected by E. T. Gilliard (H_5 on map).

Hybrid index—males, 9, 37; females, 17, 23.

These birds are close to black-bills, but some have definite wattle-bird traits. One bird, for instance, has a large throat wattle and much white on the forehead.

(5) Wahgi Mountains, above Nondugl (1620-2300 meters), collected by E. T. Gilliard (H_4 on map).

Hybrid index—males, 32, 65, 67, 76, 81, 84, 88; females, 59, 80, 81; median, 78.

Some of these specimens appear to be virtually pure wattle-birds, but at least half of the specimens are evident hybrids, one bird being definitely a "black-bill." The forehead varies from black to almost completely white. A male from Yandara (northern slope of the Bismarcks) has an index of 82.

(6) *stresemanni* (Herzog Mountains) (1400-2100 meters) (H_6 on map).

(*a*) Dawong (Mayr collection) (see Mayr, 1931).

Hybrid index—males, 41, 52; females, 27, 39, 40, 50, 55.

(*b*) Mount Misim (Stevens collection) (see Greenway, 1935).

Hybrid index—males, 25, 38, 39, 48, 61, 64; females, 32, 35, 52; median, 40.5.

Both series (*a* and *b*) are similar in their variability and are samples from an evident hybrid population. Curiously, however, the forehead is black in all birds. In most other characters the birds are closer to wattle-birds than to black-bills. About 35 per cent of the birds have superciliary and ear coverts largely white.

CORRELATION BETWEEN CHARACTERS

An examination of phenotypes is at best a poor substitute for a genetic analysis. However, since it is impossible to analyze these mountain birds genetically, at least a few remarks may be made on the probable genetic basis.

The first important fact is that a bird which shows hybridism in one character usually also indicates hybridism in several other characters.

The second is that the amount of hybridism is not the same in all characters. For instance, a female from the Hagen Mountains (A.M.N.H.) has full wattle-bird characters with respect to bill color (10), bill feathering (5), and color of the superciliary (15); is near the wattle-birds in the color of the ear coverts (4), is intermediate in the naked ocular area (3) and the gape wattle (6), and closer to the black-bills in the forehead coloring (5), the throat wattle (2), and the bill-wing ratio (4). A similar situation prevails with most specimens from the hybrid population, as is evident from table 3.

The third important fact is that every character seems to have a multifactorial basis. Every stage of intermediacy is represented in most of the hybrid populations for most of the characters. There are a few notable exceptions. One, as stated, is that all birds from the Herzog Mountain have a black forehead, no matter how close to a wattle-bird they may be in other characters. Another is that all birds from Mount Goliath have a gray bill no matter how purely "black-bill" they are in all other characters.

Table 4 indicates clearly that the various characters by no means show the same degree of intermediacy in the various populations. The bill, for instance, is grayer in all five hybrid populations (1, 2, 4, 5 and 6 above) than expected according to the "mean hybridity" of the respective population. The forehead, on the other hand, has less white in all five populations than should be expected on the basis of "mean hybridity." The throat wattle also scores lower than expectation in all five populations. Gape-wattle and naked ocular area score higher in all populations except the Wahgi Mountains. There is no regularity (nor great deviations from expectation) with respect to the color of the ear coverts and the feathering at the base of the bill. Finally, there are two characters which deviate from expectancy, according to whether the population as a whole is more wattle-bird or more black-bill. The bill-wing ratio is above expectation in the three

Table 3
Characters of All Examined Specimens from Five Hybrid Populations

Maximal scores for each of nine characters			15	15	10	5	5	15	20	10	5	100
Locality	Sex	Altitude	Bill/ wing	Throat wattle	Gape wattle	Ocular area	Ear coverts	Super- ciliary	Fore- head	Bill color	Bill feathering	Total
Mt. Goliath	♂	?	8	1	8	2	1	1	0	10	1	32
	♀	?	9	7	6	3	1	1	0	10	1	38
	♂	?	9	1	4	3	1	1	0	10	1	30
	♂	?	12	0	4	4	0	0	0	10	5	35
	♀	?	0	1	4	3	1	1	0	10	1	21
	♂	?	11	1	3	3	3	3	0	10	1	35
	♂	imm. ?	10	1	5	3	3	3	0	10	1	36
	Median		9	1	4	3	1	1	0	10	1	35
Mt. Hagen	♂	8200	3	4	7	4	1	0	3	4	5	31
	♀	8200	4	2	6	3	4	15	5	10	5	54
	♀	11000	4	0	3	0	0	0	0	2	1	10
	♀	11000	3	0	3	3	0	0	0	0	0	9
	♂	8200	3	0	3	1	0	1	0	1	0	9
	♂	8200	4	1	1	1	0	0	0	0	0	7
	♂	8200	4	0	1	0	0	0	0	2	0	7
	♂	8200	6	0	0	0	0	0	0	2	1	9
	Median		4	0	3	1	0	0	0	2	1	9
Mt. Wilhelm	♂	9500	5	10	4	1	1	0	12	3	1	37
	♀	11000	4	0	4	2	0	1	0	3	3	17
	♀	11000	6	0	2	1	3	5	3	3	0	23
	♂	9500	4	2	1	1	1	0	0	0	0	9
	Median		4.5	1	3	1	1	1	2	3	1	20
Wahgi Mts.	♂	6000	15	13	10	4	5	15	15	10	1	88
	♂	6500	11	11	9	3	5	15	15	10	5	84
	♂	6000	9	13	9	5	5	15	10	10	5	81
	♂	6500	9	12	8	5	3	5	10	10	3	65
	♀	6500	13	5	8	4	5	15	15	10	5	80
	♂	6500	11	11	8	5	4	13	0	10	5	67
	♂	5300	12	10	7	3	4	10	15	10	5	76
	♂	7500	8	8	6	2	1	1	0	3	3	32
	♀	6500	12	13	5	4	5	15	12	10	5	81
	♀	6500	8	0	4	1	3	1	0	4	1	22
	Median		11	11	8	4	4	14	11	10	5	78
Herzog Mts.	♂	Mt. Misim	6	7	9	4	1	1	0	10	1	39
	♂	Mt. Misim	6	2	8	4	4	13	0	10	1	48
	♂	Mt. Misim	7	11	8	4	5	15	0	10	1	61
	♂	Dawong	4	13	7	4	3	10	0	10	1	52
	♂	Mt. Misim	6	9	7	3	1	1	0	10	1	38
	♂	Mt. Misim	4	1	5	2	1	1	0	10	1	25
	♂	Mt. Misim	6	15	6	5	4	13	0	10	5	64
	♂	Dawong	4	2	6	0	4	10	0	10	5	41
	♀	Dawong	6	0	6	0	1	1	0	10	3	27
	♀	Dawong	2	2	6	3	3	13	0	10	1	40
	♀	Mt. Misim	8	10	6	4	3	10	0	10	1	52
	♀	Mt. Misim	5	6	5	2	3	1	0	10	0	32
	♀	Dawong	8	5	5	3	4	15	0	10	0	50
	♀	Dawong	2	2	5	2	4	13	0	10	1	39
	♀	Mt. Misim	6	9	4	3	1	1	0	10	1	35
	♀	Dawong	4	10	4	4	5	15	0	10	3	55
	Median		6	6.5	6	3	3	10	0	10	1	40.5

black-bill populations and below expectancy in the two wattle-bird populations. The superciliary stripe, on the other hand, is below expectation in the three black-bill populations and above it in the two wattle-bird populations.

Table 4

Observed Medians in Per Cent of Complete Wattle-bird Characters

	Fore-head	Throat wattle	Super-ciliary	Ear coverts	Bill feathering	Mean hybrid index	Bill/ wing	Ocular area	Gape wattle	Bill color
Mt. Goliath	0	6.7	6.7	20	20	34.8	60	60	40	100
Mt. Hagen	0	0	0	0	20	13	26.7	20	30	20
Mt. Wilhelm	10	6.7	6.7	20	20	19.3	30	20	30	30
Wahgi Mountains	55	73.3	93.3	80	100	81.7	73.3	80	80	100
Herzog Mountains	0	43.3	66.7	60	20	50	40	60	60	100

The curves of variation of nearly all these populations are strongly skewed. Since the mean gives in such cases an entirely distorted picture of the character of the population, the median was chosen to indicate the central tendencies. Table 4 was calculated in a manner illustrated by the following example. The median for gape wattle of the Mount Goliath population is 4. This is 40 per cent of the value 10 found in a "pure" wattle-bird. Or, the median for forehead color in the Wahgi population is 11. This is 55 per cent of the value 20 found in a "pure" wattle-bird, and so forth (see table 4). The results of table 4 are shown graphically in figure 3.

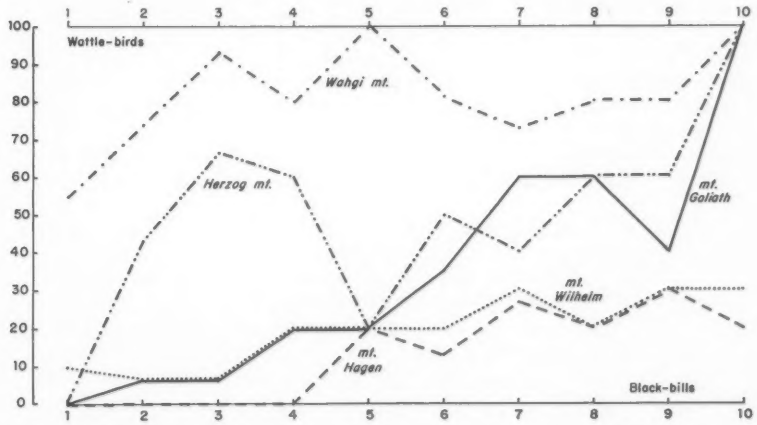

Fig. 3. Pictorial presentation of the data in table 4. Ordinate (0–100) indicates per cent of complete wattle-bird characters. Points 1–10 on abscissa indicate following characters: 1 = forehead, 2 = throat wattle, 3 = superciliary, 4 = ear coverts, 5 = bill feathering, 6 = mean hybrid index, 7 = bill/wing ratio, 8 = bare skin in ocular area, 9 = gape wattle, 10 = bill color. For further explanation, see text.

Precisely what the data presented in table 4 mean is difficult to determine. It is probable that the genes producing the various hybrid characteristics are coupled with physiological properties, which are subject to local selection. This may account for the gray bills in the Mount Goliath population and the black forehead of the Herzog Moun-

tain population. Also, comparatively few wattle-bird genes may be sufficient to pass the threshold for the "gray bill" character, while a very high concentration of wattle-bird genes may be required for the character "white forehead." The other deviations might all be explained in terms of "modifier complexes" or "genetic background," but it would be futile to do so in absence of any concrete evidence.

VARIATION AND ALTITUDE

The wattle-birds are, on the whole, inhabitants of the low mountains (1500-2000 meters), the black-bills of high mountains (2500-3400 meters). Where the black-bills

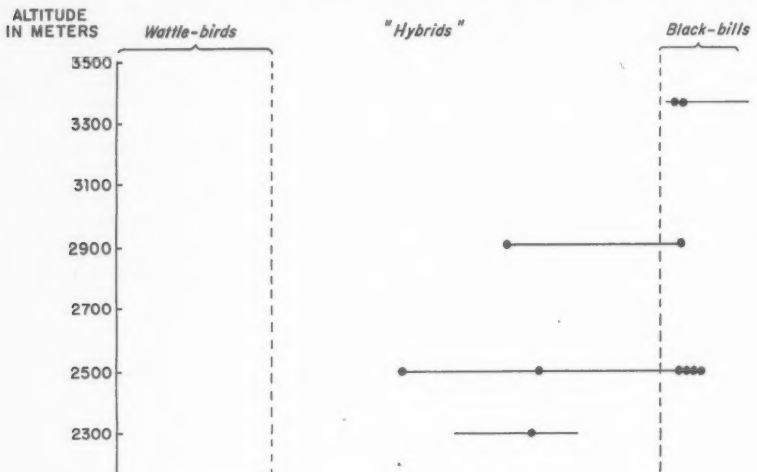

Fig. 4. Decrease of hybrid index with increase in altitude. Each point denotes a specimen collected in the Hagen-Bismarck area at the stated altitude.

are absent, as in the Saruwaged Mountains, the wattle-birds may ascend to an altitude of 2000-3400 meters. In southeastern New Guinea and apparently also in the Weyland and Oranje mountains, where the wattle-birds are absent, the black-bills descend as low as 1800 or even 1600 meters.

Collections made in the hybrid zone are not sufficiently well labeled to yield conclusive information, but there is much evidence that the hybrid index decreases with increasing altitude (fig. 4). The higher the altitude, the closer the birds resemble black-bills, on the average.

Gilliard obtained three large samples in the Hagen-Bismarcks region. The Mount Hagen sample collected at 2700-3500 meters has a median hybrid index of 9, six of eight birds being almost pure black-bills. The Mount Wilhelm (Bismarck Mountains) sample, collected about 140 kilometers farther east at the equally high altitude of 2900-3300 meters, has a median hybrid index of 20, also close to the black-bills. However, a series collected about half way between these two localities on the Wahgi Mountains, which connect the Bismarcks with the Hagen Mountains, but at the low altitude of 1600-2300 meters had a median hybrid index of 78, only 10 points below the median of 88.5 found in a pure wattle-bird series (*rufocrissalis*).

Specimens were collected at different altitudes on Mount Hagen, on Mount Wilhelm, and on the Wahgi Mountains, but most of these specimens were obtained by native hunters at unknown altitudes and brought to the base camp. No reliable correlation between hybrid index and altitude can therefore be established for a single mountain. However, the two specimens from Mount Hagen, which have the highest index were collected at the lower camp (2500 meters), and the only specimen in the Wahgi Mountains that was collected above 2000 meters had by far the lowest hybrid index (32). It is the only specimen from the Wahgi Mountains which is closer to the black-bills than to the wattle-birds. What little is definitely known about altitudinal variation on a single mountain thus fully supports the hypothesis that there is a close inverse relation between altitude and hybrid index. This is further supported by the only specimen from the Kubor Mountains collected at 1800 meters, which has a hybrid index of 76, and a single specimens from Yandara (2100 meters), north slope of the Bismarcks, with an index of 82. Both of these birds from low altitudes have essentially the characters of wattle-birds.

ORIGIN OF THE HYBRID POPULATIONS

The black-bills and the wattle-birds are allopatric, but where they come into contact they form highly variable hybrid populations. The most plausible interpretation of this situation is that wattle-birds and black-bills have attained their distinctness in geographical isolation, and have come into contact only rather recently. It would seem of interest to try to reconstruct the areas of isolation and to speculate on the nature of the isolating barriers.

The map (fig. 2) shows that two of the wattle-bird populations (W_1, W_2) are completely isolated, while the third (W_3) is on an incompletely isolated northern spur of the central ranges. The hybrid zone extends from Mount Goliath (H_1) in the west to the Herzog Mountains (H_6) in the east. Most of the hybrid populations are near the northern slopes of the central ranges, but the presence of hybrid populations on Mount Goliath (H_1) and on Mount Kubor (H_3) indicates the southward penetration of wattle-bird genes. Most puzzling is the fact that apparently pure black-bill populations occur both east and west of the hybrid zone: *joiceyi* (B_1), *kinneari* (B_2), *brassi* (B_3) (southeast New Guinea, lower altitudes), and *belfordi* (B_4) (southeast New Guinea, higher altitudes). These four subspecies are very similar to each other, differing only in size and minor details of coloration.

The present day distribution thus does not furnish a clear picture. The conspicuous differences between the three wattle-bird populations and the essential similarity of the black-bills suggest that the wattle-birds have long been isolated, while the black-bills either have had an essentially continuous distribution or have spread fairly recently.

There is much in the distribution of New Guinea birds to indicate that part of northern New Guinea was once isolated from the remainder of the island. This fact has been commented on by several authors, for instance, Hartert *et al.* (1936). Northern New

Guinea is the home of many endemic species and subspecies of birds, some of which have subsequently spread into the Vogelkop, to the south coast of New Guinea (opposite the head of Geelvink Bay) or into southeast New Guinea, without, however, losing their essential status as endemics of northern New Guinea.

Species indigenous to northern New Guinea are *Casuarius unappendiculatus, Talegalla jobiensis, Rallicula rubra, Goura victoria, Eos duivenbodei, Psittaculirostris edwardsii, Monarcha rubiensis, Poecilodryas brachyura, Manucodia jobiensis, Drepanornis bruijni, Paradisaea minor, Xanthomelus (aureus) bakeri, Philemon brassi.* Very distinct subspecies or subspecies groups of non-passerines endemic in northern New Guinea are *Ptilinopus iozonus finschi, Ptilinopus viridis salvadorii, Megaloprepia magnifica septentrionalis, Ducula pinon jobiensis, Gallicolumba rufigula septentrionalis, Trugon terrestris mayri, Charmosyna pulchella rothschildi, Micropsitta pusio beccarii, Probosciger aterrimus stenolophus, Geoffroyus geoffroyi (pucherani* group), *Alisterus chloropterus moszkowskii, Chaetura novaeguineae bürgersi, Alcyone azurea ochrogaster, Alcyone pusilla laetior, Melidora macrorhina jobiensis,* and *Halcyon nigrocyanea quadricolor.* There are even more such cases among the passerine birds, but it would lead too far to list them all.

Too little is as yet known about the geology of New Guinea to permit a decision as to whether northern New Guinea was once a real island, separated by water, or merely an ecological island separated by vegetational barriers. It is possible, for instance, that during an arid period in the late Tertiary a belt of grasslands separated the forest country in north New Guinea from similar country in central and south New Guinea. Such a grassland barrier might have permitted species formation. Perhaps the barrier was a combination of a marine basin in the Sepik-Mamberano Valleys and unsuitable habitat in a possible land bridge east of Geelvink Bay. Any further speculation would be pointless until more is known about the geological and phytogeographical history of New Guinea.

DISCUSSION

Various kinds of hybridization phenomena are known in birds and other animals. Sympatric hybridization between individuals of different populations, which otherwise behave like good species, occurs occasionally, as in birds of paradise, grouse, and ducks, but seems without evolutionary significance.

Frequent cases of allopatric hybridization, in which populations formerly isolated now interbreed in a contact zone, have also been recorded in the literature. Since acquisition of reproductive isolation and morphological divergence are not closely correlated, we find every degree of morphological difference between the hybridizing populations. The mere fact of random interbreeding is usually accepted—by definition—as proof of conspecificity, although as a taxonomist one is reluctant to unite into a single species such strikingly different forms as *Astrapia stephaniae* and *A. mayeri* (Mayr and Gilliard, 1952).

Hybridization in the *Melidectes belfordi* group belongs in this category. There appears to be random interbreeding between wattle-birds and black-bills wherever they come into contact. What distinguishes this from previously described examples of allopatric hybridization in birds is the position of the hybrid belt. Normally the hybrid zone is a geographical line (east to west, or north to south). Here the hybrid belt is in an altitudinal zone.

As stated, wattle-birds prefer lower altitudes (1600-2000 meters), black-bills higher altitudes. When these two kinds of birds met in the same mountain ranges, the black-bills became superimposed over the wattle-birds, with a hybrid belt forming in inter-

mediate altitudes. It appears from the analysis of the populations in the Hagen-Wahgi mountains that each altitudinal belt has its characteristically composed population. The explanation for the fact that there has not been a complete merging of the two ancestral populations into a single homogeneous one at all altitudes is presumably the following. The morphological characters of wattle-birds are apparently associated with genes having a selective advantage at low altitudes, the black-bill characters with such having a high selective value at high altitudes. Accordingly, in the hybrid zone there is a gradient on each mountain from prevailingly wattle-birds at lower altitudes to prevailingly black-bills at higher altitudes. Similar situations have been described by botanists for altitudinally representative "species" of plants. Selection thus prevents the complete obliteration of the two original gene complexes.

The argument might be raised that the "hybrid belt" is not due to hybridization at all but is simply an altitudinal character gradient. A study of altitudinal variation in the areas where only one of the two types (black-bills *or* wattle-birds) occurs proves conclusively the fallacy of this assumption. For instance, in areas where wattle-birds are absent black-bills have not only a much greater vertical range but also fail to show any variation of color or structure with altitude. The only altitudinal variation in these areas is one of size (table 5). In southeast New Guinea there is a rather sharp break between

Table 5

Altitudinal Variation of Wing Length of Black-bills (*Melidectes belfordi*)

Western Oranje Range (from Rand, 1942)			*Southeastern New Guinea* (from Rand, 1936)		
Altitude (in meters)	Male	Female	*Altitude (in meters)*	*Male*	*Female*
3600	144–150	121–127	*3680*	*147–153*	*140*
3225	136–151	128, 134			
2800	138–151	125–135	*2800*	*139*	*127, 131*
2200	133	125	*2400*		*139*
2150	140, 142	127, 128	*2000*	*140–144*	*127–131*
1800	133–144	116–127	*1600*	*132–144*	*123–137*

brassi (1600-2800 meters) and belfordi (± 3680 meters); in the Oranje Ranges there is no sharp break anywhere, but an indication of a step in the increase of size between 2200 and 2800 meters. In spite of greatly increased altitudinal range, the birds are thus at all altitudes of the black-bill type.

The analysis of hybridism in the *Melidectes belfordi* group adds some new aspects to the known diversity of hybridism among birds. Although lacking the perplexing complications of hybridization as found in *Passer* (Meise, 1936), *Terpsiphone* (Chapin, 1948), and *Pipilo* (Sibley, 1950), the situation in *Melidectes* again shows that morphological divergence and acquisition of a sterility barrier may be independent of each other. It also emphasizes the fact that morphological characters are the product of gene complexes which at the same time control physiological characters of considerable adaptive value.

TAXONOMIC QUESTIONS

Like all borderline cases the *Melidectes leucostephes-belfordi* group is difficult to deal with from the point of view of taxonomy. Although including all the birds in a single superspecies, recent ornithologists have almost unanimously maintained *leucostephes* (Arfak) as a separate species, while combining the other wattle-birds and the black-bills into a single species. Is this logical? If one wants to recognize species, should one

not put all wattle-birds in one species and all black-bills in another? But what to do then with all the populations between Oranje and Herzog mountains? The complete lack of reproductive isolation wherever wattle-birds and black-bills come into contact indicates that they should not be treated as two separate species in spite of the morphological differences. The current solution to place all populations (except the widely isolated *leucostephes*) into a single species is presumably the most sensible compromise.

An equally great, if not greater, quandary exists on the subspecies level. The four generally recognized subspecies of black-bills (*belfordi, brassi, kinneari,* and *joiceyi*) are less different than the various hybrid populations from mounts Hagen, Wilhelm, and Wahgi are from each other. And, intergrading populations at different altitudes of the same mountain are more different from each other than the recognized subspecies of black-bills. Yet it would be absurd to distinguish the populations in the hybrid area as different subspecies, much though they may differ from each other in the average phenotype (= median hybrid index). The most sensible solution of this difficulty is probably to list these populations simply as *Melidectes belfordi,* with locality and altitude stated in parentheses.

SUMMARY

Two subgroups of honeyeaters of the *Melidectes leucostephes-belfordi* group are allopatric in New Guinea, but interbreed freely in a broad area of contact in the mountains of central New Guinea. The two groups, which may be called "wattle-birds" and "black-bills," differ in many characters, such as proportions of the bill, color of the bill, extent of feathering on base of bill and around the eye, presence (or absence) and size of gape and throat wattles, and color of the forehead, superciliary, and ear-coverts. By scoring these characters a hybrid index can be calculated, ranging from 0 in an extreme black-bill to 100 in an extreme wattle-bird. An analysis of the hybrid index shows that there are now known six hybrid populations: Mt. Goliath (east Oranje Mountains), Hagen Mountains, Wahgi Mountains, Bismarck Mountains, Kubor Mountains, and Herzog Mountains. Some of them are closer to black-bills (Hagen, Bismarcks), others to wattle-birds (Wahgi, Herzog), but all show extreme variability. A specimen showing indications of hybridism in one character usually shows also signs of hybridism in others. The degree of intermediacy of characters indicates that they have a multifactorial basis. In the hybrid zone populations of low altitudes show a prevalance of wattle-bird characters, birds of high altitudes a prevalence of black-bill characters. Outside the hybrid zone black-bills and wattle-birds may range from 1600 meters to 3300 meters without vertical variation of morphological characters except size.

The data indicate that black-bills and wattle-birds attained morphological distinctness but not reproductive isolation in geographical isolation. When these two kinds of honeyeaters met after the breakdown of extrinsic isolation, they interbred freely. However, since their respective gene complexes had become correlated with a preference for and higher viability at different altitudes, there is now different genetic composition at different altitudes, presumably maintained by selection. The great extent of the hybrid area, from Mt. Goliath (139° 5′ E) to the Herzog Mountains (147° E), indicates that it is not a very recent condition.

ACKNOWLEDGMENTS

Dr. E. Stresemann had the great kindness of sending us all the material of the Zoological Museum in Berlin of *M. b. rufocrissalis* and of *M. b. stresemanni.* Mr. J. C. Greenway of the Museum of Comparative Zoölogy in Cambridge, Massachusetts, assisted us by sending the Stevens series of *M. b. stresemanni.* We are deeply indebted to Dr. C. Vaurie for preparing the map (fig. 2) and to Mr. Alexander Seidel for the drawings of the heads.

LITERATURE CITED

Chapin, J. P.
1948. Variation and hybridization among the paradise flycatchers of Africa. Evol., 2:111-126.
Greenway, J. C.
1935. Birds from the coastal range between the Markham and the Waria rivers, northeastern New Guinea. Proc. New England Zoöl. Club, 14:98-99.
Hartert, E., K. Paludan, Lord Rothschild, and E. Stresemann
1936. Die Vögel des Weyland-Gebirges und seines Vorlandes. Mitt. Zool. Mus. Berlin, 21:165-240.
Mayr, E.
1931. Die Vögel des Saruwaged- und Herzoggebirges (N. O. Neu-Guinea). Mitt. Zool. Mus. Berlin, 17:713-714.
1941. List of New Guinea birds. American Museum of Natural History, New York, 260 pp.
Meise, W.
1936. Zur Systematik und Verbreitungsgeschichte der Haus- und Weidensperlinge, *Passer domesticus* (L.) und *hispaniolensis* (T.). Jour. für Ornith., 84:633.
Rand, A. L.
1936. Altitudinal variation in New Guinea birds. Amer. Mus. Nov., no. 890:1-4.
1942. Results of the 1938–1939 New Guinea Expedition. Bull. Amer. Mus. Nat. Hist., 79:425-515.
Sibley, C. G.
1950. Species formation in the red-eyed towhees of Mexico. Univ. Calif. Publ. Zoöl., 50:109-194.
Stresemann, E.
1923. Dr. Bürgers' ornithologische Ausbeute im Stromgebiet des Sepik. Arch. f. Naturg., 89 A: 55-56.

American Museum of Natural History, New York, New York, June 2, 1952.

STARLINGS AS WINTER RESIDENTS IN THE UINTA BASIN, UTAH

By MERLIN L. KILLPACK and DON N. CRITTENDEN

Since Lockerbie's (1939) observations of the first Starlings (*Sturnus vulgaris*) in Utah a number of additional observations have been recorded from various western states (Beidleman, 1949; Bent, 1950; Ferrel, 1949; Godfrey, 1949; Grater, 1942; Jones, 1950; Pope, 1948; and Ransom, 1948).

The Starling has now become established as a winter resident in several areas in Utah (Woodbury, Cottam, and Sugden, 1949; and also notes from the zoology department at the University of Utah sent to us by Dr. Angus M. Woodbury). It is now desirable to describe some of the habits of these birds as winter residents in their newly occupied range, and it is our objective to do this for the Uinta Basin in the northeastern part of Utah.

Our study covers a four-year period from December, 1947, through December, 1951. Most of the data were gathered from four areas surrounding Roosevelt, in Duchesne County, Utah. The four areas were: (1) the environs of the town of Roosevelt; (2) the Winterton farm, located one mile west of Roosevelt on U. S. Highway 40; (3) the Roosevelt town garbage disposal area, referred to hereafter as "city dump"; and (4) Hancock Cove, located three miles west of Roosevelt.

As far as the writers could determine, there is no well established breeding record for the Starling from Utah. However, on July 17, 1951, a Starling, heavily spotted, was observed flying over the ordnance plant near Ogden, Weber County, Utah. Bent (1950) lists seven nesting records for Utah, but the source of his information is uncertain. Breiding (1943) and Niedrach (1945) list several nesting records for Colorado. Quaintance (1951) records one nesting record from Oregon.

Nesting records from adjacent states indicate that the first nesting Starlings chose sparsely inhabited sections. These nests were located in woodpecker holes and unused farm buildings in rural areas. It is possible that some Starlings may be nesting in the rural sections of Utah and escaping detection.

CLIMATE AND WEATHER

Climatic conditions varied considerably during the period covered by this study. During the winter of 1947, from 6 to 8 inches of snow lay on the ground from December until the middle of February. Minimum temperatures reached 15 degrees below zero. Below-freezing temperatures during the day existed most of the time during the month of January. In the winters of 1948 and 1949, heavy snows fell. Snow lay on the ground from December until the latter part of March. Minimum temperatures reached 27 degrees below zero. During most of January and the first part of February, below-freezing temperatures occurred during the day.

The winter of 1950 was mild. Only an occasional snow storm occurred. Snow did not stay on the ground longer than 3 or 4 days at a time. Above-freezing temperatures occurred during the day most of the time. Minimum temperatures reached 15 degrees below zero on two or three occasions.

Mild weather occurred in October, November, and the first part of December, 1951. Heavy snows fell during the latter part of December, and minimum temperatures reached 32 degrees below zero.

OCCURRENCE AND MIGRATION

There are no accurate records available to determine when Starlings made their first appearance in the Uinta Basin. Some residents were not aware that Starlings were other than common blackbirds until special attention was called to the fact. Others recalled

seeing them for several years, but did not know exactly when they made their first appearance. From the evidence gathered it appears probable that Starlings have been wintering in the Uinta Basin for at least ten years.

Starlings arrive in the Roosevelt area on or near November 5 of each year. In 1947, we did not begin observations until about December 17 although they had probably arrived in the Basin before that date. In 1948 and 1949, the first birds were observed at the Winterton farm on November 5. In 1950 and 1951 they arrived at the Winterton farm on November 3. These dates are comparable to those recorded in Salt Lake County, Utah, by Lockerbie (1948).

It was thought at first that the birds' movements were determined by the weather. In 1950 and 1951, the autumn season was mild with little stormy weather, yet the first date Starlings were observed at the Winterton farm was November 3. On October 19, 1951, Crittenden saw four Starlings on Myton Bench, six miles south of Roosevelt. This would tend to indicate they pass through the Uinta Basin on earlier dates than those listed above. However, the regular date for arrival at the Winterton farm suggests that Starlings may have developed regular migration habits in local parts of the state.

Local migration habits of Starlings may be interrelated with those of blackbirds. Although the writers have never seen Starlings among flocks of blackbirds in the autumn, from two to ten birds have been observed among flocks of Red-winged Blackbirds in spring migration. But otherwise, in their spring migration, Starlings congregate in small flocks of ten to one hundred birds and fly in a northwesterly direction. Starlings tend to leave the Roosevelt area about the first week in April. In 1948, the last birds were observed on March 21, in 1949 April 4, in 1950 April 15, and in 1951 April 7. In autumn they do not appear to be in association with any other species as they migrate into the Roosevelt area. They arrive in flocks of 20 to 50 birds until from 100 to 300 are congregated in the vicinity. They concentrate first at the Winterton cattle feed yards, then move into the environs of Roosevelt about December 15.

The peak in numbers of wintering Starlings occurs from the middle of December to the latter part of January. The average number of birds observed from November 5 to December 20 was approximately 150, from December 20 to January 20 approximately 500, from January 20 to March 1 about 250, from March 1 to April 1 approximately 60.

The number of birds wintering in the Roosevelt area seems to be increasing. During the winter of 1947 a total of 75 birds was observed, in 1948 approximately 450, in 1949 about 700, and in 1950 over 1000 birds in a single flock were observed on several occasions.

Although the individual birds seem to be moving in and out of the Roosevelt area continuously between December 1 and April 1, some were at least partially established as winter residents. Birds banded in Roosevelt January 7 and February 8, 1950, and January 18, 1951, were taken in the same locality February 11 and March 18, 1950, and February 1, 1951, respectively. Birds migrating into the area for the first time could be distinguished by their actions. Resident birds seemed to be familiar with the feeding areas, knew what sections offered the best protection, and would fly to these areas without hesitation. On the other hand, new migrants seemed to become confused when disturbed. Banding efforts have not as yet yielded any records to indicate that any of the same individuals return year after year.

FOOD HABITS

Ninety-five stomachs were analyzed to obtain the data on food. Stomach contents were segregated and measured in cubic centimeters. The foods were separated into plant, animal, and garbage groups.

Plant foods consisted of the fruit of Russian olives (*Elaeagnus angustifolia*), grain, corn silage, hay, and weed seeds.

Animal food included Coleoptera, Hemiptera, pupae of Diptera, Anoplura, snail, and Locustidae. Garbage consisted of waste foods, hair and bone.

Birds collected for stomach analyses were obtained on all four study areas mentioned above. Samples taken from all four areas did not show any appreciable difference in the kind of foods eaten. This would indicate that their choice of food was fairly consistent or that they move about from area to area in search of food.

Table 1

Contents of 95 Stomachs of Starlings Taken in Roosevelt Area and Expressed in Volume Per Cent

Food	Per cent for 1947-49	Per cent for 1950	Per cent for the 4 years
A. Plant food	64.81	80.42	73.79
1. Russian olive	17.35	50.10	36.16
2. Grain	26.13	21.08	23.27
3. Corn silage	16.13	9.24	12.16
4. Alfalfa hay	4.97	.....	2.11
5. Weed seeds	.23	.....	.09
B. Animal food	2.70	5.02	4.05
1. Coleoptera	1.72	3.62	2.82
a. Scarabaeidae	1.49	3.47	2.63
b. Coccinellidae	.....	.10	.06
c. Curculionidae	.23	.05	.13
2. Hemiptera	.04	.10	.07
3. Diptera pupae	.89	....	.38
4. Anoplura	....	.10	.06
5. Snail	....	.10	.06
6. Locustidae	.05	1.10	.66
C. Garbage	32.49	14.56	22.16
Total per cent	100 100	100 100	100 100

Data from the stomach contents (table 1) indicate that plant foods make up 73.79 per cent of their diet, garbage 22.16 per cent, and animal food only 4.05 per cent. Russian olive fruits (fig. 1), comprising 36.16 per cent, is the principal food eaten. Grain comes second, with 23.27 per cent, garbage third with 21.47 per cent, and corn silage fourth with 12.16 per cent.

Table 1 shows a variation in the quantity of the foods eaten between the winter seasons of 1947-49 and that of 1950. The percentage of plant food eaten increased from 64.81 per cent during the period from 1947-49 to 80.42 per cent in 1950. This was due to the increased intake of fruits of the Russian olive. These increased from 17.35 per cent to 50.10 per cent, grain decreased from 26.13 per cent to 21.08, and garbage decreased from 32.49 per cent to 14.56 per cent. Animal foods nearly doubled in the amount consumed, comprising 2.70 per cent in 1947-49 and 5.02 per cent in 1950. These differences may be due to differences in sampling, inasmuch as almost half of the specimens used were obtained in 1950 alone.

In table 2 figures on percentage of individual birds eating the various foods more or less parallel the figures on the quantity of food eaten (table 1) except that the number of birds eating animal food is high in proportion to the volume consumed.

In the winter of 1950, Starlings were observed feeding more abundantly in Russian olive trees and in open fields than in former winters. The number of birds feeding at

the cattle feed yards was less. There were approximately 100 birds feeding at the Winterton feed lots during the winter of 1950 where from 200 to 300 were observed in previous winters.

In the years that the ground was covered with snow, Starlings would flock to the bare sections as the snow melted in late winters. Some of the late winter migrants were observed feeding in the *Sarcobatus* and *Distichlis* plant communities. On one occasion, January 21, 1950, five Starlings and three Red-shafted Flickers (*Colaptes cafer*) were observed eating frozen fruit on an apple tree located in Hancock Cove.

Fig. 1. Russian olive (*Elaeagnus angustifolia*), principal food eaten by Starlings in the Uinta Basin, Utah. Photograph taken using a mounted specimen near Winterton Farm, February 14, 1951.

Grain and possibly corn silage are the only items in their diet that would tend to be of any economic importance should their numbers become great.

ROOSTING

The first evidence of roosting was obtained in the winter of 1949. One roost was noted one-fourth mile north of the Winterton farm, one in the Hancock Cove, one at the city dump, and two on the east edge of Roosevelt. All of the roosting sites were open-fronted, straw-thatched cattle shelters (figs. 2 and 3). Starlings and English Sparrows roosted together in tunnels dug in the straw roofs (fig. 3). No Starlings were found in any of the sheds with the entrances partially enclosed by wire or doors. In the winter of 1949, Starlings were seen in or at these roosting sites throughout their stay. Even the last three birds observed on April 15, 1950, were seen flying to one of the roosting sites on the east side of town.

In 1950 no night-roosts were discovered although several efforts were made to trace the birds as they left their feeding areas. They would form into flocks of approximately 100 birds and fly toward the southwest. This course is the same taken by Red-winged Blackbirds at roosting time. Evidently they were roosting in an area away from habitations as no one reported seeing them at roosting time.

During the sub-zero weather of 1950, which occurred during the week of January 29 to February 3, three Starlings were observed roosting with chickens seven miles north-

west of Roosevelt. Approximately fifty birds had been feeding in this area for some time. However, these three birds, caught and banded, were the only ones entering the chicken house for roosting purposes. None was found later in the same area when the temperatures increased.

Fig. 2. Typical open-fronted, straw-thatched cattle shelter used by Starlings for roosting in severe weather. Photograph taken February 16, 1950.

Some Starlings used the crevices in the ledges on the sides of a low bluff near the Winterton farm for roosting purposes in the extreme cold weather occurring the last

Table 2

The Number and Percentage of Times Each Kind of Food Occurred in 95 Starling Stomachs Analyzed

Food	1947-49		1950		Total for 4 years	
	Number	Per cent	Number	Per cent	Number	Per cent
A. Plant food	31	67.39	41	83.67	72	75.79
1. Russian olive	13	28.26	25	51.02	38	40.00
2. Grain	12	26.09	18	36.73	32	33.68
3. Corn silage	12	26.09	5	10.20	17	18.94
4. Alfalfa hay	4	8.70	0	00.00	4	4.21
5. Weed seeds	6	13.04	0	00.00	6	6.32
B. Animal food	15	32.61	29	59.18	44	46.31
1. Coleoptera	11	23.91	28	57.14	39	40.53
a. Scarabaeidae	9	19.57	25	51.02	34	35.79
b. Coccinellidae	0	00.00	4	8.16	4	4.21
c. Curculionidae	2	4.25	3	6.12	5	5.26
2. Hemiptera	1	2.17	2	4.08	3	4.35
3. Diptera pupae	6	13.04	0	00.00	6	6.32
4. Anoplura	0	00.00	1	2.04	1	1.05
5. Snail	0	00.00	1	2.04	1	1.05
6. Locustidae	6	13.04	9	18.37	15	15.79
C. Garbage	17	36.96	14	28.57	31	32.63

week of December, 1951, and first week of January, 1952. In this same period several birds were observed using the roosting sites at the city dump and at a spot one-fourth mile south of the Winterton farm. One Starling was caught roosting in the attic of the Roosevelt Junior High School on January 10, 1952.

Fig. 3. Typical holes dug in roof of straw-thatched cattle shelters by English Sparrows and used as roosting sites by Starlings.

Wright (1909) indicated that Starlings had a difficult time surviving the cold weather. She cited several examples where birds were found dead at the roosting site with ample food supplies available. The writers found only one dead bird at a roosting site. This would suggest that Starlings are well adapted to the severe climatic conditions of northern Utah.

SUMMARY

Starlings have been wintering in the Uinta Basin, Utah, since 1947 and perhaps since about 1942. They arrive about November 5 of each year and leave the area about the first week in April. Weather conditions do not seem to influence the timing of their arrival. Migration appears to be continuous throughout the winter season, but this may merely be suggested by local movements. It was proved, through banding efforts, that some of the individual birds had remained in the area of Roosevelt, Duchesne County, Utah, as winter residents at least over part of the winter season. It is probable that some individuals stay the full winter season.

The major foods eaten by Starlings in the Roosevelt area, listed in order of importance, are (1) Russian olive fruits, (2) grains, (3) garbage, and (4) corn silage.

Starlings withstand the cold winter nights by roosting with English Sparrows in holes dug in the roof of open-fronted, straw-thatched cattle shelters.

As far as could be determined the Starling has not yet become established as a breeding species in the state of Utah; however, it is possible that it nests in outlying parts of northern Utah.

ACKNOWLEDGEMENTS

The writers wish to extend thanks to Dr. Angus M. Woodbury, Biological Department of the University of Utah, for making available notes on file in his department. Thanks are extended to

Dr. Vasco M. Tanner and Dr. D. Elden Beck of the Zoological Department at the Brigham Young University, for identifying food items and for their helpful suggestions. We are especially grateful to Dr. C. L. Hayward in the same department, for his assistance in preparing this manuscript.

We also extend thanks to Omni and Van Winterton on whose property data were gathered and to students at Roosevelt High School who helped in gathering specimens for food habit studies. Appreciation also is extended to Eva C. Killpack for typing the manuscript.

LITERATURE CITED

Beidleman, R. G.
1949. Starling and rusty blackbird records for Boulder County, Colorado. Condor, 51:97.
Bent, A. C.
1950. Life histories of North American wagtails, shrikes, vireos, and their allies. U. S. Nat. Mus. Bull., 197:182-214.
Breiding, G. H.
1943. Starling nesting in Colorado. Wilson Bull., 55:247.
Ferrel, C. M.
1949. Starling in the Sacramento Valley, California. Condor, 51:150.
Godfrey, W. E.
1949. European starling reaches the Pacific Coast. Can. Field Nat., 63:117.
Grater, R. K.
1942. Starlings in southern Utah. Condor, 44:41.
Jones, F. L.
1950. The starling in Glenn County, California. Condor, 52:141.
Lockerbie, C. W.
1939. Starlings arrive in Utah. Condor, 41:170.
1948. Audubon Field Notes, 2:21.
Niedrach, R. J.
1945. Colorado nesting records of starlings. Wilson Bull., 57:261.
Pope, P.
1948. European starling at Walla Walla, Washington. Murrelet, 29:29.
Quaintance, C. W.
1951. Pioneer starling nesting in eastern Oregon. Condor, 53:50.
Ransom, W.
1948. European starling taken in Cowlitz County, western Washington. Murrelet, 29:28-29.
Woodbury, A. M., Cottam, C., and Sugden, J. W.
1949. Annotated check-list of the birds of Utah. Bull. Univ. Utah, vol. 39, no. 16:1-27.
Wright, M. O.
1909. Birdcraft (New York, MacMillan Co.).

Union High School and Roosevelt Junior High School, Roosevelt, Utah, February 15, 1952.

WINTER BIRD CENSUS AT XILITLA, SAN LUIS POTOSI, MEXICO

By L. IRBY DAVIS

In an organized, cooperative effort a group of bird students worked, variously from three to seven days, during the Christmas holidays of 1951, to obtain a second winter-bird census in the region of Xilitla, San Luis Potosí, México. The group consisted of Richard Bentley, Jerram L. Brown, Philip P. Caswell, Anna May Davis, Coralyn Davis, L. Irby Davis, Robert Drawe, Jr., Malcolm Gordon, Jean W. Graber, Richard R. Graber, William J. Hamilton III, Pauline James, William S. Jennings, Marshall Johnston, Edgar Kincaid, Jr., William Lidicker, Jr., John Maroney, Jr., Marcella Newman, Robert J. Newman, Richard C. Rosche, Chester M. Rowell, Charles R. Shaw, Carolyn Somers, and George M. Sutton. A preliminary survey was made on November 22, 23 and 24 by Anna May Davis, L. Irby Davis and Pauline James. The number of teams working simultaneously varied from one to ten on different days, but there were at least nine teams in the field on three of the days and seven in the field on a fourth. L. Irby Davis and Edgar Kincaid, Jr., worked as a single team on January 4 and 5, 1952.

The area covered by the various teams represents a typical strip across the mountain range on which Xilitla is located. Each team worked in a limited altitudinal range and worked out from a point on the road which runs from the Rio Axtla through Xilitla to Ahuacatlan and beyond. The area between 5000 and 7000 feet was worked by Jean W. Graber and Richard R. Graber from a base camp on the slope of Cerro Conejo. All work was confined to a circle of seven and one-half miles' radius with a center in the eastern part of the town of Xilitla. Time spent in the field and total number of species seen on different dates are summarized in table 1. The areas covered (fig. 1) were as follows:

A. Tropical forest along Rio Axtla and the river itself, including an area along the road to Xilitla, from the ferry upward one mile, or to point where the road begins to climb up the mountain. The bench forest was obviously quite dense before it was altered by selective cutting. Since the whole region covered by the census has been more or less under cultivation by the native Indians for centuries, it is impossible to say that there is any "virgin" forest in any part of it. Most of the wooded tracts in the vicinity of area A are planted in coffee although at least one mango orchard is included. Coffee is grown as an underbrush shrub with the forest trees remaining in a fairly dense stand to supply shade. The mango trees are tall and mature, and since weeds and shrubs are growing in the understory, the orchard has about the same appearance as forest. Throughout this area epiphytes are common and in most places the underbrush is quite dense. Along the bank of the river there are many trees some of which are very large. They include *Ceiba pentandra, Pithecollobrium dulce, Ficus lapathifolia, Elaphrim simaruba,* and many other species including scattered trees of *Tabebuia pentaphylla, Taxodium mucronatum* and *Platanus glabrata.* Hanging over the water are many clumps of bamboo (*Bambas aculeata*), which may grow as a dense thicket in a belt of one hundred feet or more along the bank.

B. More than half of the bench forest has been cleared and in this area we now have fields and pastures. At the time of the census most of the fields were grown up in weeds. The pastures contained grasses, many rank weeds and clumps of shrubs; there were also scattered trees of different sizes. Elevation about 300 feet.

C. This area begins one and one-half miles beyond the ferry on the road to Xilitla, where the 500-foot level is reached, and extends along the road for 1.7 miles to the 1000-foot level. Cultivated parts of the 500-1000 foot interval are planted largely in coffee, but there are some small patches of bananas and citrus trees near the native huts. The terrain is rough and the slopes steep. Throughout the region the grades are so steep and the turns so frequent that the road mileage is roughly double the air-line mileage. There are deep, narrow canyons in which the plant growth becomes progressively more luxuriant with increasing altitude and humidity. Ferns and epiphytes become more plentiful. The forest trees contain many species but perhaps the commonest one is *Elaphrim simaruba.* Other

species include *Ficus lapathifolia, Pithecollobrium arboreum, Melia azedarach, Croton niveus, Croton draco, Jatropa urens, Ceiba pentandra, Icica copal* and *Castilla elestica*. The understory tends to be dense with ferns, vines and shrubs.

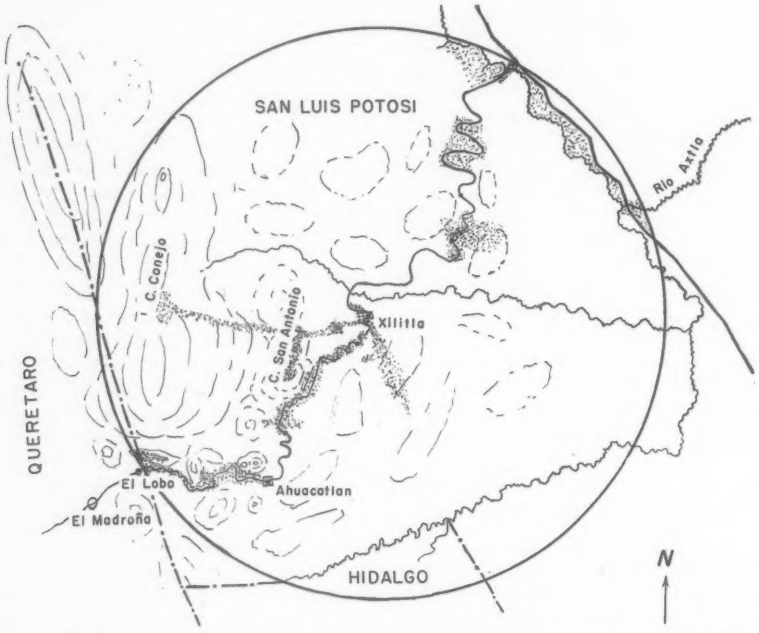

Fig. 1. Region of southern San Luis Potosí where winter birds were censused. The circle indicates 7.5 miles' distance from Xilitla at the center. Stippled parts of the map show areas from which census data were gathered.

D. An area between 1500 and 2200 feet, which is planted almost entirely in coffee except for that part of the upper limit which includes the village of Xilitla. Selective cutting has made three species of trees, which we were unable to identify for lack of flowers and fruit, quite common as shade pro-

Table 1

Party-hours Spent in Census Areas

Date	Area A	B	C	D	E	F	G	H	I	J	K	L	M	Total hours	Species
1951—															
Nov. 22	½	½												1	15
Nov. 23	½	½		2							½	1½		5	55
Nov. 24	4	4												8	60
Dec. 27	9½	7½	7½	12½	5			1			2¾	3¼		49	144
Dec. 28	10	6½		6	5	2	3½	6½	3½	6	2¾	2	3	56¾	149
Dec. 29	11	6	9¼	18	6	3	2	5½	12	4½	3¼	3	8	91½	164
Dec. 30	7½	3	9	17	5	4½	1	3½	6	3			6	65¼	145
Dec. 31	8½	3	¼											11¾	58
1952—															
Jan. 4	5	2												7	59
Jan. 5	¼	½	1	1½	1	½		1			2	2¼		10	50
Totals	56¼	34	27	57	22	10	6½	17½	21½	13½	11¼	12	17	305½	238

ducers in tracts of coffee near Xilitla. The other forest trees were largely the same as in area C. In spots where there has been much cutting in recent years without regard to selection ("waste spots," road shoulders, etc.), *Melia, Croton* and *Jatropa* are very common. *Erythrina* is abundant in Xilitla; the blossoms greatly attract hummingbirds. The terrain in this area is similar to that in area C. The humidity is greater, however, and the plant growth still more luxuriant. The rainfall at Xilitla is said to be about 100 inches per year, but there is five times as much rain from May through October as in the other half of the year. Still, even in the winter months, the northeast slope of the mountains does not appear to suffer from drought. Most of the limestone cliffs are dripping with moisture in the rainy season. These are covered with begonias and other rock plants. On more level spots there are many sink holes and deep crevices in the rocks, which openings are so choked with vegetation that they can scarcely be seen. Ferns and "elephant-ears" grow rankly, and in places the ground is carpeted with *Selaginella* to a depth of eight inches. The trees are lofty and are so covered with a great profusion of other plants (*Philodendron, Peperomia, Aechmea, Tillandsia*; also ferns, cacti, orchids and mistletoe) that no bark is visible on the trunks or larger limbs. There is great variation in even a single group of these epiphytes; for instance the ferns vary from tiny moss-like species with fronds only a few millimeters long to giant "staghorns" with fronds several feet in length. In short, this is tropical, mountain rain forest somewhat modified by coffee planting.

The relatively open spots in the village and around some of the farm houses permitted the listing of such birds as the Sparrow Hawk, which would probably be absent from the dense woods of the other parts of the area. The Pintails listed in this area were seen flying over a small opening.

E. An area between 2200 and 3000 feet. In this wooded area the transition from tropical plants to "sub-tropical" or temperate-zone species begins. At 2500 feet, sweet gum and oak trees become common. The tracts covered were all southwest of Xilitla where the woods are relatively open. Epiphytes are relatively less numerous and smaller than at lower altitudes, and almost all under-shrubs had been recently cut out to permit the planting of new coffee plants. In a few spots where coffee has not been planted, *Melia* has become dominant.

F. Open areas between 2200 and 3000 feet. These are fields and pastures (mostly corn fields now largely grown up in grass and weeds), with bushes and trees along fence rows.

G. Woods between 3000 and 4000 feet. Here occur sweet gum and oak trees with understory of tree ferns (on the most humid slope of Cerro San Antonio), or shrubs and vines. Epiphytes are common but the growth is less lush than in area D.

H. Open areas between 3000 and 4000 feet. Similar to F.

I. Wooded areas between 4000 and 5000 feet; oak-sweet gum-tree fern association.

J. Open areas between 4000 and 5000 feet; mostly shrubby, hillside pastures on wet side of the mountain.

K. Open areas between 4000 and 5000 feet; mostly rocky canyons, dry weedy fields or bushy pastures on dry slope of mountain (west of Ahuacatlan).

L. A level area at 5000 feet on dry side of mountain (west of Ahuacatlan); mixed pine and oak woods; ground covered with scattered shrubs and grass; epiphytes and vines relatively scarce.

M. Woods on wet slope of mountain (Cerro Conejo) between 5000 and 7000 feet; mostly pine but some oak at the lowest altitudes.

Official data on the rainfall of the area west of Ahuacatlan are not available but the general appearance of the plants suggests (K and L above) that there is less than half as much moisture available as is found on the wet slope of the mountain.

A mild cold front came into the region on the night of December 26. The 27th was chilly and cloudy with a slow rain all day. The following days were mostly clear after early morning fog, which was very heavy along the river where it hung until about 9:30 a.m. most days. The temperature varied from about 55 to 85°F. On January 4, 1952, it rained again all day but the following day was bright and clear.

The early part of 1951 brought freezing weather to Xilitla for the first time in more than fifty years. Most of the tropical trees in the 2000-3000 foot level were either killed outright or severely damaged with new growth sprouting out from the trunks. The result

was a tremendous decrease in the supply of blossoms and fruit at this level over many miles of territory. Where hardy trees were in use, only the coffee plants below were killed and had to be replanted. The underbrush was largely cleared to make way for the planting and this brought about a much more open look to the woods. As compared with December, 1951, the conditions in 1950 were very different and in fact seemed to be the most favorable possible for wintering birds. In 1950 only one census was made at Xilitla (Audubon Field Notes, April, 1951), whereas several daily counts were taken in 1951. But the startling differences in results leave little doubt that even greater differences would have been found had more days been devoted to the counting in 1950.

A comparison of the data for the two years suggests that the Coppery-tailed Trogon, Jalapa Trogon, Gartered Trogon, Mexican Antshrike, Rose-throated Becard, Black Phoebe, Jalapa Robin, Gray Robin, Mexican Pepper-shrike and others are partly migratory in this region. For example, in 1950, 111 Gray Robins were listed in a single day (72 party-hours), whereas, in 1951, 4 was the greatest number listed on any one of the census days and 18 was the grand total listed in all counts (305½ party-hours). Northern birds wintering in the region also showed a big drop: In 1950 there were 203 Pileolated Warblers listed, but in 1951 the most found in a single day was 59. By way of contrast we may consider such common, permanent residents as the Black Vulture and Brown Jay. In 1951 the greatest number of Black Vultures listed in a single day was 201; in 1950 the number was 255. In 1951 there were 175 Brown Jays counted one day, while in 1950 the number was 172. In comparing data for the two years as given in table 2, it must be borne in mind that the 1951 total includes repeats for some or all of the days, whereas the 1950 data include few if any repeats as they represent a single day in the field.

Thus far I find no evidence of regular altitudinal migration, but there is definite indication that some shifting up and down the mountain does occur. In 1950 all the White-crowned Parrots were seen between 4000 and 5000 feet, while in 1951 most of them were seen between 500 and 1000 feet. In 1951 all the Brown-headed Chlorospinguses were above 3000 feet, while most of them in 1950 were in area E, in which none was found in 1951. Since area E showed the greatest degree of freeze damage, it may be that this had something to do with the differences in distribution. Or it may be that nonbreeding birds will shift either up or down the mountain depending upon available food.

Some things not shown by the data in table 2 should be pointed out: The Wood Duck (*Aix sponsa*) had never before been listed in the state. What was believed to be the same individual, a female, was found at the same spot on the Rio Axtla on three consecutive days by William S. Jennings.

The Black Crane Hawk (*Geranospiza nigra*), not previously listed in the region, was identified by Robert J. Newman.

The bird listed as a Common Screech Owl (*Otus asio*) was observed in the town of Xilitla by Marshall Johnston. The only Screech Owls collected in the region have been identified as Guatemalan Screech Owls, but these were all obtained at much higher elevation.

The Burrowing Owl (*Speotyto cunicularia*) was found by L. Irby Davis just west of the town of Ahuacatlan. It was on the ground near a roadside ditch and flew over a wall when approached.

Lest someone be misled by the fact that a number of Collared Swifts (*Streptoprocne zonaris*) were listed this year while none was seen in the previous year, it should be noted that they were just as common in 1950 but could not be listed on the day of the census

Table 2

1951 Winter Census in the Xilitla Region, San Luis Potosí

(Largest number listed in each area in one day)

Area	A	B	C	D	E	F	G	H	I	J	K	L	M	Total 1951 (all days)	Total 1950 (one day)
TINAMIDAE															
Crypturellus cinnamomeus	6	0	3	4	0	0	0	0	0	0	0	0	0	24	2
COLYMBIDAE															
Colymbus dominicus	4	0	0	0	0	0	0	0	0	0	0	0	0	18	14
Podilymbus podiceps	9	0	0	0	0	0	0	0	0	0	0	0	0	48	30
PHALACROCORACIDAE															
Phalacrocorax olivaceus														0	41
ANHINGIDAE															
Anhinga anhinga	2	0	0	0	0	0	0	0	0	0	0	0	0	8	6
ARDEIDAE															
Ardea herodias	3	0	0	0	0	0	0	0	0	0	0	0	0	6	0
Butorides virescens	5	0	0	0	0	0	0	0	0	0	0	0	0	17	7
Florida caerulea	3	0	0	0	0	0	0	0	0	0	0	0	0	9	6
Casmerodius albus														0	15
Leucophoyx thula	2	0	0	0	0	0	0	0	0	0	0	0	0	6	6
Hydranassa tricolor														0	1
THRESKIORNITHIDAE															
Plegadis mexicana														0	2
ANATIDAE															
Anas platyrhynchos														0	9
Anas cyanoptera	1	0	0	0	0	0	0	0	0	0	0	0	0	1	6
Anas discors														0	20
Anas crecca														0	18
Anas acuta	42	0	0	11	0	0	0	0	0	0	0	0	0	53	9
Anas strepera	3	0	0	0	0	0	0	0	0	0	0	0	0	6	67
Mareca americana	4	0	0	0	0	0	0	0	0	0	0	0	0	9	25
Spatula clypeata														0	4
Aix sponsa	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Aythya americana														0	4
CATHARTIDAE															
Coragyps atratus	102	47	19	102	73	15	0	22	1	27	23	10	3	759	255
Cathartes aura	7	10	9	12	23	1	0	38	0	5	16	1	11	291	54
ACCIPITRIDAE															
Accipiter bicolor	0	0	0	1	0	0	0	0	0	0	0	0	0	1	2
Accipiter cooperii	0	2	1	0	1	1	1	1	1	0	0	0	0	10	3
Accipiter striatus	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Buteo jamaicensis	0	0	0	0	0	0	0	3	0	0	4	1	0	10	3
Buteo albonotatus	0	1	1	0	0	0	2	0	0	0	0	0	0	4	2
Buteo magnirostris	2	5	0	0	0	0	0	0	0	0	0	0	0	13	6
Buteo nitidus	2	4	1	1	0	0	0	0	0	0	0	0	0	15	8
Hypomorphnus urubitinga	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Buteogallus anthracinus	1	2	0	0	0	0	0	0	0	0	0	0	0	4	1
Circus cyaneus	0	1	1	0	0	0	0	1	0	0	1	0	0	5	1
Geranospiza nigra	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
PANDIONIDAE															
Pandion haliaetus	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
FALCONIDAE															
Herpetotheres cachinnans	3	0	0	0	0	0	0	0	0	0	0	0	0	5	0
Micrastur semitorquatus														0	1
Micrastur ruficollis	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Caracara cheriway	0	3	0	0	0	0	0	0	0	0	0	0	0	6	15
Falco peregrinus	0	1	0	0	0	0	0	0	0	0	0	0	0	2	2
Falco albigularis	1	2	0	0	0	0	0	0	0	0	0	0	0	5	0
Falco columbarius	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Falco sparverius	2	10	1	3	1	2	0	11	0	0	7	0	0	86	21

Table 2 (continued)

Area	(Largest number listed in each area in one day) A	B	C	D	E	F	G	H	I	J	K	L	M	Total 1951 (all days)	1950 (one day)
CRACIDAE															
Ortalis vetula	9	0	1	4	2	3	0	0	0	0	0	0	0	63	9
PHASIANIDAE															
Dendrortyx barbatus	0	0	0	0	0	0	0	0	6	0	0	2	3	17	0
Colinus virginianus	0	15	0	0	0	0	0	0	0	0	0	0	0	42	8
Dactylortyx thoracicus														0	5
RALLIDAE															
Gallinula chloropus	5	0	0	0	0	0	0	0	0	0	0	0	0	15	5
Porphyrula martinica														0	1
Fulica americana	27	0	0	0	0	0	0	0	0	0	0	0	0	103	109
HELIORNITHIDAE															
Helinornis fulica	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0
JACANIDAE															
Jacana spinosa														0	9
CHARADRIIDAE															
Charadrius vociferus	9	0	0	0	0	0	0	0	0	0	0	0	0	17	9
SCOLOPACIDAE															
Actitis macularia	11	0	0	0	0	0	0	0	0	0	0	0	0	29	13
Capella gallinago														0	3
LARIDAE															
Larus delawarensis	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Larus argentatus	14	0	0	0	0	0	0	0	0	0	0	0	0	14	7
COLUMBIDAE															
Columba flavirostris	23	32	2	75	0	0	0	0	0	0	0	0	0	209	143
Zenaidura macroura	0	0	0	0	0	0	0	0	0	0	0	6	0	6	0
Zenaida asiatica	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0
Scardafella inca	0	7	1	7	0	0	0	0	0	0	2	0	0	26	8
Columbigallina passerina	0	1	0	0	0	0	0	0	0	0	0	0	0	1	3
Columbigallina talpacoti	0	6	0	0	0	0	0	0	0	0	0	0	0	15	7
Leptotila verreauxi	4	2	4	18	7	3	1	1	0	0	0	0	0	75	23
Oreopeleia montana	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1
Oreopeleia albifacies	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0
PSITTACIDAE															
Ara militaris	0	0	0	0	37	10	0	10	0	7	0	0	0	99	38
Aratinga holochlora	104	225	448	510	150	5	0	0	0	0	0	0	0	3123	84
Aratinga astec	8	0	36	100	0	0	0	0	0	0	0	0	0	228	0
Pionus senilis	0	0	18	3	0	0	0	0	0	7	0	0	0	53	5
Amazona viridigenalis	10	41	5	0	8	0	0	0	0	0	0	0	0	108	551
Amazona autumnalis	42	50	66	12	0	0	0	0	0	0	0	0	0	343	754
Amazona ochrocephala	36	0	0	0	0	0	0	0	0	0	0	0	0	46	30
CUCULIDAE															
Piaya cayana	2	0	1	6	0	0	0	0	0	0	0	0	0	16	11
Crotophaga sulcirostris	32	32	9	14	3	0	0	0	0	0	0	0	0	228	75
Geococcyx californianus	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
TYTONIDAE															
Tyto alba														0	1
STRIGIDAE															
Otus asio?	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Bubo? (or *Strix* sp.?)	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Glaucidium brasilianum	1	1	0	0	0	0	0	0	0	0	0	0	0	3	1
Speotyto cunicularia	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
Ciccaba virgata	0	0	0	0	0	0	1	0	2	3	0	0	2	8	3
CAPRIMULGIDAE															
Nyctidromus albicollis	1	0	0	2	0	0	0	0	0	0	0	0	0	5	4
Phalaenoptilus nuttallii	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Caprimulgus vociferus	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1

Table 2 (continued)

(Largest number listed in each area in one day)

Area	A	B	C	D	E	F	G	H	I	J	K	L	M	Total 1951 (all days)	Total 1950 (one day)
APODIDAE															
Streptoprocne zonaris	100	0	0	0	0	0	0	0	0	5	0	0	0	156	0
Aeronautes saxatalis														0	380
TROCHILIDAE															
Campylopterus curvipennis	1	0	10	1	1	3	2	2	0	0	0	0	0	22	2
Anthracothorax prevostii														0	1
Chlorostilbon canivetii	0	0	1	1	0	0	0	0	0	0	0	0	0	3	7
Cynanthus latirostris	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Hylocharis leucotis	0	0	0	0	0	0	0	0	0	0	0	1	4	5	1
Amazilia candida														0	1
Amazilia cyanocephala	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Amazilia yucatanensis	2	1	0	0	0	1	0	0	0	0	0	0	0	5	8
Lampornis amethystinus	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Eugenes fulgens	1	1	3	1	1	0	0	0	0	0	0	0	0	9	36
Calothorax lucifer														0	1
Archilochus colubris														0	3
TROGONIDAE															
Trogon mexicanus	0	0	0	0	0	0	2	0	4	0	0	0	7	18	2
Trogon elegans	1	0	0	1	0	0	0	0	0	0	0	0	0	2	5
Trogon collaris	0	0	1	0	0	0	0	0	0	0	0	0	0	1	9
Trogon violaceus	0	0	1	0	0	0	0	0	0	0	0	0	0	1	5
ALCEDINIDAE															
Megaceryle torquata	2	0	0	0	0	0	0	0	0	0	0	0	0	10	1
Megaceryle alcyon	2	0	0	0	0	0	0	0	0	0	0	0	0	4	6
Chloroceryle amazona	10	0	0	0	0	0	0	0	0	0	0	0	0	25	12
Chloroceryle americana	9	0	0	0	0	0	0	0	0	0	0	0	0	39	20
Chloroceryle aenea	3	0	0	0	0	0	0	0	0	0	0	0	0	6	7
MOMOTIDAE															
Momotus momota	0	0	1	1	1	0	0	0	0	0	0	0	0	4	5
RAMPHASTIDAE															
Ramphastos sulphuratus														0	4
Aulacorhynchus prasinus	0	0	8	3	0	0	0	0	0	0	0	0	0	11	20
PICIDAE															
Colaptes cafer	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Piculus aeruginosus	1	0	2	4	1	0	0	0	0	0	0	0	0	14	6
Dryocopus lineatus	1	0	3	0	0	0	0	0	0	0	0	0	0	5	2
Melanerpes formicivora	0	0	0	0	6	0	0	0	0	1	2	5	2	32	15
Centurus aurifrons	9	7	3	7	1	0	0	0	0	0	0	0	0	64	8
Sphyrapicus varius	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Veniliornis fumigatus	1	0	3	9	2	0	0	0	1	0	0	0	0	25	4
Dendrocopus villosus	0	0	0	0	0	0	0	0	0	0	0	1	1	3	2
Dendrocopos scalaris	3	3	0	1	0	0	0	0	0	0	0	0	0	14	1
Phloeoceastes guatemalensis	1	2	0	0	0	0	0	0	0	0	0	0	0	4	1
DENDROCOLAPTIDAE															
Sittasomus griseicapillus	0	0	1	1	0	0	0	0	0	0	0	0	0	3	5
Xiphocolaptes promeropirhynchus	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0
Xiphorhynchus flavigaster	2	1	2	7	2	0	0	0	0	0	0	0	0	21	29
Lepidocolaptes affinis	0	0	1	1	0	0	1	0	11	0	0	0	6	36	26
FORMICARIIDAE															
Thamnophilus doliatus	0	0	0	1	1	0	0	0	0	0	0	0	0	2	10
COTINGIDAE															
Platypsaris aglaiae	1	2	1	0	1	0	0	0	0	0	0	0	0	6	17
Tityra semifasciata	2	2	8	10	2	0	0	0	0	0	0	0	0	54	14
Tityra inquisitor	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0

Table 2 (continued)

(Largest number listed in each area in one day)

Area	A	B	C	D	E	F	G	H	I	J	K	L	M	Total 1951 (all days)	Total 1950 (one day)
TYRANNIDAE															
Sayornis phoebe	4	6	0	2	0	1	0	0	0	0	0	0	0	29	15
Sayornis nigricans	1	0	0	0	0	0	0	0	0	0	0	0	0	4	5
Pyrocephalus rubinus	0	16	2	0	0	0	0	0	0	0	0	0	0	60	40
Tyrannus melancholicus	8	13	0	2	1	0	0	0	0	0	0	0	0	81	20
Megarynchus pitangua	8	12	9	34	12	1	0	0	0	0	0	0	0	192	26
Myiozetetes similis	34	43	0	4	2	2	0	1	0	0	0	0	0	187	145
Pitangus sulphuratus	8	8	0	7	1	1	0	0	0	0	0	0	0	55	31
Myiarchus tyrannulus														0	3
Myiarchus tuberculifer	5	11	5	7	3	4	3	1	1	2	3	0	0	97	16
Contopus virens														0	2
Contopus pertinax	2	3	0	3	2	4	0	1	0	0	2	2	0	37	23
Emidonax sp.	1	1	3	4	1	1	0	1	1	1	2	1	3	30	17
Empidonax difficilis	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Mitrephanes phaeocercus	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
HIRUNDINIDAE															
Stelgidopteryx ruficollis	40	1	0	0	0	0	0	0	0	0	0	0	0	82	0
Iridoprocne albilinea														0	1
CORVIDAE															
Corvus corax	0	0	0	0	1	1	0	0	1	0	0	2	7	15	7
Psilorhinus morio	50	24	43	57	31	11	0	4	0	0	0	0	0	573	172
Xanthoura yncas	5	6	6	23	0	0	0	0	0	0	0	0	0	74	38
Cyanolyca cucullata	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0
Aphelocoma ultramarina	0	0	0	0	0	0	0	0	0	0	0	15	7	54	11
Cyanocitta stelleri	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
PARIDAE															
Parus wollweberi	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
TROGLODYTIDAE															
Thryothorus rutilus	2	0	4	8	7	4	3	5	0	0	0	0	0	55	23
Thryomanes bewickii														0	1
Troglodytes aedon	4	4	2	6	6	11	0	2	0	4	2	5	0	84	25
Troglodytes brunneicollis	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0
Henicorhina leucosticta	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Henicorhina leucophrys	0	0	0	0	0	0	6	0	15	12	0	0	6	66	5
Catherpes mexicanus	0	0	0	6	3	1	0	1	0	1	4	0	0	32	1
MIMIDAE															
Toxostoma longirostre	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2
Melanotis caerulescens	0	0	0	1	0	0	0	0	0	2	0	0	1	5	4
Dumetella carolinensis	3	0	0	0	0	0	0	0	0	0	0	0	0	3	8
Mimus polyglottos	0	3	0	0	0	0	0	0	0	0	0	0	0	4	6
TURDIDAE															
Turdus migratorius	0	0	0	0	0	1	0	0	0	0	0	0	0	1	3
Turdus grayi	2	2	1	1	1	0	0	0	0	0	0	0	0	18	111
Turdus assimilis	0	0	0	1	0	0	0	0	0	0	0	0	0	1	9
Turdus infuscatus														0	1
Myadestes obscurus	0	0	0	0	0	0	0	0	3	0	0	0	7	16	15
Myadestes unicolor														0	1
Hylocichla mustelina	1	0	2	0	0	0	0	0	0	0	0	0	0	1	0
Hylocichla guttata	0	0	0	0	0	1	0	0	0	1	1	3	0	8	8
Catharus mexicanus	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
Catharus occidentalis	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Catharus aurantiirostris	0	0	0	0	0	0	2	0	3	0	0	0	0	5	0
Sialia sialis	0	0	0	0	0	0	0	0	0	0	4	0	0	14	4
SYLVIIDAE															
Polioptila caerulea	36	17	15	7	10	2	0	2	0	0	1	1	0	194	89
Regulus calendula	1	1	0	1	1	2	1	2	9	0	1	12	22	122	41

Table 2 (continued)

(Largest number listed in each area in one day)

Area	A	B	C	D	E	F	G	H	I	J	K	L	M	Total 1951 (all days)	Total 1950 (one day)
BOMBYCILLIDAE															
Bombycilla cedrorum	0	3	0	0	0	0	0	0	0	0	0	0	0	3	258
PTILOGONATIDAE															
Ptilogonys cinereus	0	0	0	0	0	0	0	2	0	0	0	0	1	3	7
CYCLARHIDAE															
Cyclarhis gujanensis	0	1	0	0	0	0	0	0	0	0	0	0	0	1	6
VIREONIDAE															
Vireo griseus	6	1	1	0	0	0	0	1	0	1	0	0	0	20	15
Vireo huttoni	0	0	0	0	0	0	0	0	0	0	0	5	3	15	0
Vireo solitarius	3	3	2	2	6	2	0	0	3	0	1	4	2	48	24
Vireo virescens	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
COEREBIDAE															
Cyanerpes cyaneus	0	0	1	0	0	0	0	0	0	0	0	0	0	1	9
COMPSOTHLYPIDAE															
Mniotilta varia	6	3	1	2	3	1	0	0	1	0	1	3	1	38	29
Vermivora peregrina														0	1
Vermivora celata	1	2	0	2	4	2	0	4	0	0	0	0	1	23	12
Vermivora ruficapilla	0	2	0	2	4	5	0	0	4	0	1	1	0	27	105
Vermivora virginiae														0	1
Vermivora superciliosa	0	0	0	0	0	0	0	0	0	1	0	1	2	8	4
Parula pitiayumi	0	0	10	1	0	0	0	0	0	0	0	0	0	13	7
Peucedramus olivaceus														0	4
Dendroica aestiva	0	1	0	0	0	0	0	0	0	0	0	0	0	1	3
Dendroica magnolia	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Dendroica coronata	4	0	0	0	1	0	0	0	0	0	2	13	0	40	12
Dendroica auduboni	1	0	0	0	0	0	0	0	0	0	15	10	0	44	4
Dendroica nigrescens	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Dendroica townsendi	0	0	0	0	0	2	0	1	0	0	0	7	8	39	13
Dendroica virens	7	4	5	3	8	1	1	0	2	0	0	0	0	92	75
Dendroica occidentalis	0	0	0	0	1	0	0	0	0	0	0	2	3	15	9
Dendroica fusca	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Dendroica dominica	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Dendroica graciae														0	1
Seiurus aurocapillus														0	1
Seiurus noveboracensis														0	8
Seiurus motacilla	1	0	0	0	0	0	0	0	0	0	0	0	0	2	8
Oporornis tolmiei	0	0	0	1	1	1	0	0	0	1	0	0	0	5	1
Geothlypis trichas	1	2	0	0	0	0	0	0	0	0	0	0	0	5	21
Geothlypis nelsoni	0	0	0	0	0	0	0	0	0	2	0	0	0	4	8
Chamaethlypis poliocephala	0	1	0	0	0	3	0	0	0	0	0	0	0	5	7
Icteria virens	1	1	0	0	0	0	0	0	0	0	0	0	0	4	7
Wilsonia pusilla	20	6	5	27	19	9	5	13	5	6	2	3	4	231	203
Setophaga picta	0	0	0	0	0	0	0	0	0	0	0	1	0	2	4
Myioborus miniatus	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Euthlypis lachrymosa	0	0	4	0	0	0	0	0	0	0	0	0	0	6	4
Basileuterus rufifrons	0	0	0	2	16	0	0	5	2	6	0	3	0	52	50
Basileuterus culicivorus	3	0	1	3	0	0	0	0	1	0	0	0	1	18	19
Basileuterus belli	0	0	0	0	0	0	4	0	21	0	0	0	9	47	1
PLOCEIDAE															
Passer domesticus	0	0	0	4	0	0	0	0	0	0	0	0	0	4	1
ICTERIDAE															
Amblycercus holosericeus	0	0	1	0	0	0	1	0	0	0	0	0	0	2	6
Tangavius aeneus	0	100	0	0	0	0	0	0	0	0	0	0	0	164	0
Molothrus ater														0	1
Cassidix mexicanus	7	305	4	12	2	12	0	0	0	0	0	0	0	1057	117

Table 2 (continued)

Area	A	B	C	D	E	F	G	H	I	J	K	L	M	Total 1951 (all days)	Total 1950 (one day)
(Largest number listed in each area in one day)															
Euphagus cyanocephalus	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Dives dives	79	12	58	41	17	10	0	0	0	0	0	0	0	493	169
Icterus galbula	2	1	0	0	0	0	0	0	0	0	0	0	0	4	3
Icterus bullockii	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Icterus spurius	0	3	0	1	0	0	0	0	0	0	0	0	0	4	0
Icterus parisorum	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0
Icterus graduacauda	7	1	8	25	9	5	1	0	0	0	0	6	1	102	38
Icterus gularis	11	13	4	1	0	0	0	0	0	0	0	0	0	64	19
Icterus cucullatus	2	3	3	1	1	0	0	0	0	0	0	0	0	21	10
Sturnella magna	0	2	0	0	0	0	0	0	0	0	0	0	0	4	0
THRAUPIDAE															
Tanagra musica	0	0	0	5	0	0	0	0	0	0	0	0	0	5	2
Tanagra affinis	10	5	0	2	0	0	0	0	0	0	0	0	0	31	3
Tanagra lauta	11	8	0	4	0	0	0	0	0	0	0	0	0	43	26
Thraupis episcopus	3	0	0	0	0	0	0	0	0	0	0	0	0	5	0
Thraupis abbas	10	30	4	4	2	8	0	0	0	0	0	0	0	89	152
Piranga rubra	2	3	3	3	0	0	0	0	0	0	0	0	0	17	17
Piranga flava	0	0	0	1	0	0	0	0	0	0	0	2	2	14	19
Piranga leucoptera	1	0	0	3	2	0	0	0	0	0	0	0	0	8	8
Piranga ludoviciana														0	1
Piranga bidentata	1	0	0	2	0	0	0	0	0	0	0	0	0	3	1
Habia rubica														0	7
Habia gutturalis	3	1	3	0	0	0	0	0	0	0	0	0	0	13	7
Chlorospingus ophthalmicus	0	0	0	0	0	0	41	8	21	0	0	0	3	88	130
FRINGILLIDAE															
Saltator atriceps	14	20	15	10	0	5	0	0	0	0	0	0	0	139	71
Saltator coerulescens	1	1	0	0	0	0	0	0	0	0	0	0	0	2	11
Rhodothraupis celaeno	0	1	0	9	0	0	0	0	0	0	0	0	0	12	38
Richmondena cardinalis	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4
Pheucticus ludovicianus	2	0	1	1	0	0	0	0	0	0	0	0	0	4	7
Pheucticus melanocephalus	0	0	0	0	2	0	0	1	0	0	0	3	0	7	8
Guiraca caerulea	0	0	0	0	0	1	0	6	0	0	6	0	0	18	8
Cyanocompsa parellina														0	7
Passerina cyanea	54	2	0	0	1	0	0	0	0	0	0	0	0	74	10
Passerina ciris	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0
Tiaris olivacea	0	10	0	2	0	8	0	6	0	4	15	0	0	52	57
Carpodacus mexicanus	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Sporophila torqueola	1	113	0	0	0	5	0	6	0	1	2	0	0	216	106
Volatinia jacarina	0	1	0	0	0	0	0	0	0	0	0	0	0	2	1
Spinus notatus	0	0	0	31	0	0	0	0	0	12	14	0	0	127	4
Spinus tristis	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0
Spinus psaltria	0	25	0	2	0	23	0	10	0	1	31	0	0	114	37
Loxia curvirostra														0	10
Atlapetes pileatus	0	0	0	0	2	0	3	0	5	5	0	3	0	27	7
Atlapetes albinucha	0	0	0	0	3	0	0	0	0	5	0	0	0	8	2
Atlapetes brunnei-nucha	0	0	0	0	0	2	0	1	2	0	0	0	0	5	0
Arremonops rufivirgatus	2	2	0	1	3	2	0	0	0	0	0	0	0	16	14
Pipilo maculatus	0	0	0	0	0	0	0	0	0	0	0	2	0	5	2
Pipilo fuscus	0	0	0	0	0	0	0	0	0	0	7	0	0	7	4
Aimophila rufescens	0	0	0	4	0	0	0	0	3	0	1	0	0	9	4
Aimophila ruficeps														0	1
Junco phaeonotus	0	0	0	0	0	0	0	0	0	0	0	2	0	3	2
Spizella passerina	0	0	0	0	0	0	0	0	0	0	16	2	0	25	110
Melospiza lincolnii	3	3	0	1	2	4	0	0	0	40	2	2	0	72	9
Total individuals	2533	3585	1605	2782	716	298	89	298	200	211	280	355	226	13178	6444
Total species	121	87	66	95	60	51	19	34	27	30	35	40	38	238	230

because of the weather. There was a heavy blanket of clouds just above the tree tops all day in the area where the birds usually fly.

The Western Flycatcher (*Empidonax difficilis*) was picked up dead by Pauline James. The wing formula and all measurements fitted the species. All other members of this group were simply lumped as *Empidonax* sp. It is likely that the Yellow-bellied, Least, and Alder flycatchers are included.

The Yellow Warbler (*Dendroica aestiva*) was identified by Malcolm Gordon, who stated that it was a female or juvenile without red stripes but that the yellow patches in the tail were distinctly seen.

The Black-throated Gray Warbler (*Dendroica nigrescens*) was listed by Marshall Johnston. The species has never been collected in the region.

The Bullock Oriole (*Icterus bullockii*) was identified by Edgar Kincaid, Jr., who stated that the bird was a female and too white below for any other species.

The Scott Oriole (*Icterus parisorum*) was listed by L. Irby Davis. It was in juvenal plumage, just beginning to show a bit of sooty color on the chin and crown. It gave one short burst of song on a sunny morning (the typical "Western Meadowlark" effort). The species has not been found in the region before. It was observed at the same spot at the extreme western edge of the area on two days.

The lone Blue Honeycreeper (*Cyanerpes cyaneus*) listed was a female.

Both Blue-black Grassquits (*Volatinia jacarina*) were in relatively dark brown plumage and showed fine dark lines on the breast; hence they are presumed to have been females or juveniles. It is my opinion that winter males in brown plumage would have been lighter.

The House Finch (*Carpodacus mexicanus*) was listed by George M. Sutton, who also listed the American Goldfinches (*Spinus tristis*) and stated that the call note, distinctly heard, made identification easy.

The White-winged Doves (*Zenaida asiatica*) were seen only on November 23 and the Mourning Doves (*Zenaidura macroura*) only on January 5.

Harlingen, Texas, March 11, 1952.

TAXONOMIC STATUS OF THE BANK SWALLOW OF NORTH AMERICA

By SAMUEL A. ARNY

The United States National Museum recently acquired a collection of birds from north-central Alaska through Dr. Lawrence P. Irving, biologist with the United States Public Health Service. In this collection there were 22 Bank Swallows (*Riparia riparia*), including 8 adults and 10 young, from the Yukon Valley in the vicinity of Eagle and 40-Mile, 3 adults from Bettles, and 1 adult from Tolugak Lake. All were darker than other Alaskan skins in the collection of the United States National Museum.

This difference in color led me to believe that possibly *R. r. ijimae*, a dark race occurring in southeastern Siberia and heretofore recorded for North American on the basis of only two specimens (Bailey, *et al.*, Prog. Act. Chicago Acad. Sci., 4, 1933:35; and Huey, Auk, 55, 1938:555), might be more common than previously supposed. Adults in the series obtained by Irving are as dark as topotypical specimens of *R. r. ijimae*, but agree in size (see table) with North American specimens. Young are as dark as adults and decidedly unlike the young of the Siberian race. The latter have a greater number of rufous-tipped dorsal feathers, particularly on the head.

Since color was the only difference between Irving's specimens and those from North America as a whole, it seemed logical that post-mortem color-change might have occurred. Specimens in the National Museum, when arranged in chronological order, varied in color from almost black, as in the Irving series, through gray to a dirty brown. All skins between the ages of 10 and 100 years were approximately the same color. Skins 2 and 3 years old showed some signs of change, being lighter than relatively fresh specimens, but still definitely gray. The complete change from a dark to a dirty brown apparently takes place within the first 7 to 10 years.

If it is assumed that this tendency to post-mortem color-change is not restricted to specimens of North American Bank Swallows, then it follows that the skins of *R. r. ijimae* used in this study were also darker when fresh, and hence they may not have been reliable for comparative purposes. It may be further postulated that the application of the name *R. r. ijimae* to the two birds which represent the only North American records of this race might very well have been the result of a comparison of fresh specimens with older and browner skins from North America. The two would appear distinct enough to be called different races, and fresh specimens would approximate in color even the older skins of *R. r. ijimae*. The measurements as well as the color of the specimens in question check with those of skins of comparable post-mortem age from North America. Under the circumstances, it appears that Irving's specimens and the two previously designated as *R. r. ijimae* are not members of that race but belong to the North American form.

The Bank Swallow of North America was separated from that of Europe by Stejneger in 1885 (Bull. U. S. Nat. Mus., 29:378). He found that the American population had a shorter wing, a less deeply forked tail in proportion to the length of the hind toe plus the claw, and a larger foot. To this population he gave the name *maximiliani*. This race has been recognized by some authorities (Oberholser, Bird Life of Louisiana, 1938:405), but not by the A.O.U. Check-list Committee nor by Hellmayr (Cat. Birds Amer., 8, 1935:63). The latter did note the differences pointed out by Stejneger and stated that if this population were recognized it should be called *R. r. maximiliani*. Data from skins used in this study support Stejneger's original contention. North American adults do average slightly smaller in wing length and depth of tail-fork. The former are less rufous than the latter, a feature particularly noticeable in the young. In most of

the European young, the feathers of the lower back and upper tail coverts are extensively tipped with rufous. The same areas in birds from North America are comparatively dark.

In conclusion, after examination of both specimens of *Riparia riparia ijimae* reported from North America, it appears that both represent the American race, suggesting the Siberian race merely because of the color difference between fresh and older, "foxed" skins. That race hence does not occur in North America and should be deleted from the A.O.U. Check-list. Secondly, the North American population of *Riparia riparia* is separable from that of Europe and Asia on the basis of two mensural characters and should be recognized. The name *R. r. maximiliani* (Stejneger) is available for this population.

Comparative Measurements of Adult Specimens of *Riparia riparia*

Character measured	Range (in mm.)	Average	Number of specimens examined[3]
R. r. riparia (Europe and Asia)			
Wing length[1]	100.5–109.8	103.8[2]	5♂♂; 3♀♀
Depth of tail fork	5.0– 10.2	8.4	4♂♂; 3♀♀
Tarsus	9.9– 10.3	10.0	1♂; 2♀♀
Exposed culmen	5.2– 6.1	5.8	1♂; 2♀♀
R. r. ijimae (Siberia and Japan)			
Wing length	97.5–106.9	102.2[2]	6♂♂; 4♀♀
Depth of tail fork	9.2– 12.2	10.6	6♂♂; 4♀♀
Tarsus	10.2– 10.6	10.4	1♂; 1♀
Exposed culmen	6.0– 6.2	6.1	1♂; 1♀
R. r. maximiliani (North America)			
Wing length	93.5–106.4	99.9[2]	31♂♂; 17♀♀
Depth of tail fork	4.2– 11.8	8.1	25♂♂; 17♀♀
Tarsus	9.7– 10.4	10.1	6♂♂; 4♀♀
Exposed culmen	5.7– 6.2	6.0	6♂♂; 4♀♀
Irving's series from Alaska			
Wing length	95.6–102.7	99.5[2]	6♂♂; 5♀♀; 1 unsexed
Depth of tail fork	5.2– 10.0	7.7	6♂♂; 5♀♀; 1 unsexed
Tarsus	9.4– 11.2	10.2	6♂♂; 5♀♀; 1 unsexed
Exposed culmen	5.2– 6.4	5.9	6♂♂; 5♀♀; 1 unsexed
1 adult male from Alaska previously called "*ijimae*"			
Wing length	101.0–101.5[2]		
Depth of tail fork	10.0		
Tarsus	9.8– 10.0		

[1] Chord.
[2] Includes measurement of both wings in each specimen where practicable.
[3] The following numbers of immature specimens were examined: *R. r. riparia*, 10; *R. r. maximiliani*, 45; and *R. r. ijimae*, 3.

For the loan of pertinent material, I am indebted to the following institutions: Chicago Academy of Sciences, San Diego Society of Natural History, American Museum of Natural History, Museum of Comparative Zoology, and the United States National Museum.

United States National Museum, Washington, D.C., August 4, 1952.

FROM FIELD AND STUDY

Supplementary Bird Records for Nevada.—Since the publication of Linsdale's reports on Nevada birds (Pac. Coast Avif. No. 23, 1936; Condor, 53, 1951:228-249) the writers have accumulated additional significant information on the distribution and seasonal occurrence of certain species of birds in the state. All specimens are preserved in the University of Nevada Museum of Biology. We wish to thank Dr. Alden H. Miller of the Museum of Vertebrate Zoology for determining the hummingbird and the cowbirds.

Mareca penelope. European Widgeon. Listed incorrectly by Linsdale as collected in November, 1948, in Reno on the basis of misinformation sent him by us. Actually a male was seen on several occasions at Idlewild Park, Reno, in the fall of 1944 (Johnson). The bird was associated with semi-domesticated Mallards (*Anas platyrhynchos*) and allowed very close approach, making certain identification possible.

Buteo swainsoni. Swainson Hawk. Found breeding in southernmost Nye County: Ash Meadows on June 19, 1951; Pahrump Ranch on June 22, 1951, where a nest with two month-old young was observed. These records extend the known breeding range of this species well south in the state, for Smokey Valley in northern Nye County is the southernmost breeding station given by Linsdale.

Erolia bairdii. Baird Sandpiper. On September 14, 1950, a female was taken from a group of three at the north shore of Washoe Lake, Washoe County (Johnson). This record and Linsdale's report of the two in Smokey Valley, Nye County, on August 20, 1932, apparently constitute the only records of this species in Nevada since 1872.

Zenaida asiatica. White-winged Dove. Linsdale lists a single White-winged Dove seen on May 9, 1934, along the Colorado River in southernmost Clark County. We saw two birds, probably a pair, repeatedly at Pahrump Ranch, Nye County, on June 22, 1951, in company with about 75 Mourning Doves (*Zenaidura macroura*). This apparently is the second record of this dove in Nevada.

Asio flammeus. Short-eared Owl. Recorded as resident in Nevada by Linsdale apparently on the basis of a specimen from Ruby Lake taken on June 27, 1928. A nest with week-old young found in Washoe Valley on May 5, 1950 (Richardson), affords proof that this species is resident.

Stellula calliope. Calliope Hummingbird. Pine Grove, Mineral County, is the southernmost locality in the state given by Linsdale. A specimen, identified by Dr. A. H. Miller, was taken by us in extreme southern Nye County at Ash Meadows on June 24, 1951.

Auriparus flaviceps. Verdin. A common breeding species in mesquite thickets of Ash Meadows and near Pahrump Ranch, Nye County. Three specimens were taken from Ash Meadows in June of 1951. Formerly the Verdin was known in Nevada only as resident along the Colorado River drainage system.

Regulus satrapa. Golden-crowned Kinglet. Linsdale records this species as resident on some of the mountain ranges in the eastern part of the state. A single bird was seen in Reno in October, 1944, and several were noted on February 29, 1948, along Hunter Creek at 5000 feet near Reno (Johnson). On March 20, 1948, H. I. Fisher and V. K. Johnson saw one at Galena Creek Ranger Station, also in Washoe County. This species is to be looked for as a resident in the Carson Range near Lake Tahoe.

Sturnus vulgaris. Starling. Shirl Coleman of the Nevada Fish and Game Commission reports to us that during the week of June 27, 1947, he observed a single Starling at close range in Pahrump Valley, Clark County. This appears to be the first early summer record for the state. From January 28 to February 11, 1951, nomadic flocks of a few birds to about 150 individuals visited the area of meadowland from the northeast city limits of Reno to Vista, two miles east of Sparks. Three specimens were collected from these flocks (Johnson). Flocks of Starlings, sometimes of over 100 birds, have been seen repeatedly in this region during the winter of 1951-1952 and up to the time of this writing.

Mniotilta varia. Black-and-white Warbler. H. I. Fisher and V. Mowbray positively identified an individual of this species at Galena Creek on September 13, 1947. This apparently is the second record for Nevada.

Icterus cucullatus. Hooded Oriole. Linsdale gives one record of this species for Nevada, a female taken on June 12, 1929, at Pahrump. A male was taken on April 3, 1950, at the north end of Ash Meadows (Johnson). We collected another male at Pahrump on June 21, 1951. This bird was actively

foraging and then making repeated trips into a tall ornamental palm, probably indicating the first nesting record for Nevada.

Molothrus ater. Common Cowbird. Of three specimens in breeding condition taken in June, 1951, at Ash Meadows, a male and a female have been determined as *obscurus* by A. H. Miller; the female is toward *artemisiae*. This evidence indicates that *obscurus*, recorded heretofore in Nevada only along the Colorado River, is the breeding cowbird of Ash Meadows, although Linsdale records a June specimen from Beatty (40 miles northwest of Ash Meadows) as *artemisiae* (1936:116).—NED K. JOHNSON and FRANK RICHARDSON, *University of Nevada, Reno, Nevada, April 2, 1952.*

Two Nestling Robins With Abnormal Beaks.—The recent paper by Fox (Condor, 54, 1952: 160-162) on the abnormal growth of beaks of birds prompts me to offer the following observation. During the 1951 nesting season I found in Memorial Cemetery, Scott County, Iowa, a nest of a Robin (*Turdus migratorius*) that contained four nestlings that would have left the nest in another day. Of these four birds two of them had deformed beaks. The best way to describe them would be to say that they reminded one of the mandibles of crossbills (*Loxia*), the only difference being that when the mandibles were closed there was an opening of one-quarter of an inch between the upper and lower mandibles. The birds were able to accept food without any difficulty from the adults and were apparently in just as good physical condition as the other two nestlings. Both adults were observed through glasses and their mandibles were normal. This particular example may be just another shred of evidence to sustain the thesis that some of the abnormal beaks of birds may be genetic in origin.—JAMES HODGES, *Davenport, Iowa, June 13, 1952.*

Notes on Bonasa and Numenius in Alaska.—It seems desirable to place on record specimens of two species recently handled in the course of reviewing Alaskan bird material.

Bonasa umbellus.—On September 24, 1943, I collected three Ruffed Grouse just below the Canadian line on Channel Island in the Taku River. At that time there were approximately thirty birds on this island in four or more coveys. The specimens were examined by John W. Aldrich who wrote: "Your three specimens do not approach very closely any of the three nearest races, namely, *yukonensis, umbelloides,* and *affinis,* but seem to approach most closely in color *phaia,* from the relatively humid western slopes of the Rockies in northern Idaho and northeastern Washington. They are somewhat darker and more grayish than *phaia,* however. Furthermore, the tarsus appears to be more extensively feathered in which respect they are closer to *umbelloides.*" Since birds from Atlin, British Columbia. which is near the headwaters of the Taku River, were assigned to *umbelloides* by Aldrich and Friedmann (Condor, 45, 1943:99), the specimens from Channel Island probably are closer geographically to that race than to any other. Despite the uncertainty of subspecific identification, it seems desirable to record the fact that this species does occur in southeastern Alaska.

Numenius phaeopus variegatus.—Bailey (Auk, 56, 1939:333) records a specimen of the Siberian Whimbrel taken by Brower at Barrow, Alaska, on June 10, 1938, as the first record for North America. There is, however, an Alaskan specimen in my collection (no. 3975) which antedates Brower's bird. It is a bird without sex identification in rather worn plumage collected at Savoonga, St. Lawrence Island, on July 23, 1937, by Gren Collins and sent to me as a salted skin.—IRA N. GABRIELSON, *Wildlife Management Institute, Washington, D.C., June 10, 1952.*

Inland Record of Sanderling.—According to Grinnell and Miller (Pac. Coast Avif. No. 27, 1944:151), the only available inland record of the Sanderling (*Crocethia alba*) for California was obtained on the Salton Sea. Although the species has been reported in western Nevada (Linsdale, Condor, 53, 1951:234), an additional record from inland California is offered here. Six individuals were observed in the spring of 1952 in the Lower Klamath Basin, Siskiyou County. On May 6, one was observed on a rocky dike bordering the north side of the Lower Sump of Tule Lake Refuge. Two were seen, associating with a small flock of Western and Red-backed sandpipers, on a small mud flat bordering a barley field on May 16, also on Tule Lake Refuge. On May 20, three were observed with a flock of the same species of sandpipers flitting from one mud-bar to another on Unit 4 of Lower Klamath Refuge. One female of this latter group was collected and sent to the National Museum, Washington, D.C.—PAUL E. STEEL, *Tule Lake National Wildlife Refuge, Tulelake, California, June 23, 1952.*

A Hawk Owl Bathing With Snow.—As the daylight begins to lengthen in late winter and early spring, one or two Hawk Owls (*Surnia ulula*) are occasionally seen, usually for several days at a time, perched about the campus of the University of Alaska on telephone poles and in the tops of the taller spruce trees (*Picea glauca* and *P. mariana*). During one such occurrence, in March of 1950, the following observation was made.

On a clear, relatively warm morning subsequent to a light snow-fall the previous night, one of a pair of Hawk Owls, which had been about the campus for several days, alighted on the flattened top of a pole that it had been seen to frequent a great deal. About two inches of fresh, dry snow capped the top of the pole. The owl perched on the edge of the pole for several seconds, and then very much in the manner of a bird about to incubate eggs, it settled itself down into the snow-covering, with wings partially spread, the tail somewhat elevated, and the body feathers ruffed out, whereupon it commenced a vigorous bathing.

With its face partially buried in the snow, the whole head and body were shaken, thus scattering the snow generally all about, much of it falling into the air. But certain specific movements of the head were directed to throwing bits of the snow over its back and wings. After going through this exercise for several seconds, the owl would stand very erect for a few more moments and then repeat the bathing, which it did several times during the course of two or three minutes. This observation was made from a second-story window, approximately at a level with the owl and about thirty yards distant.—Tom J. Cade, *Alaska Cooperative Wildlife Research Unit, College, Alaska, May 15, 1952.*

Black-crowned Night Heron Breeds in Heart of Mexico City.—Herbert Friedmann, Ludlow Griscom and Robert T. Moore (Pac. Coast Avif. No. 29, 1950:32, Distributional Check-list of the Birds of Mexico) have listed the Black-crowned Night Heron (*Nycticorax nycticorax hoactli*) as a breeder and resident of several states in Mexico but no record is given for the Distrito Federal.

At this writing I have a heronry of this species under observation in Chapultepec Park in the very heart of Mexico City. There are approximately 82 herons in the colony. As a whole, the heronry is not very prolific; there are eleven productive pairs, each pair attending one nest, while all the rest of the birds appear to be unmated. The eleven nests of the heronry are all in one ahuehuete tree about fifty feet high. It is an interesting fact that four of the eleven mated females are young birds in their first or second year, which is easily determined by the difference in plumages of the young and the adults, the young bittern-like birds being predominantly brown in sharp contrast with the beautiful coloring of the older birds. This observation indicates that these birds mature sexually prior to the molt which produces a fully adult plumage.

The proportion of young "water dogs," as this heron is called in Mexico, to adults is about one to three; approximately thirty per cent of the colony are immature birds.

The heronry is at a small artificial lake in the park, and the herons are not even slightly disturbed by the multitude of canoes and row boats that are about all during the day, nor are they disturbed by automobile traffic on a street less than 300 feet away.—Guillermo José Tapia, *México, D.F., July 21, 1952.*

Winter Status of Swallows in California.—During the past three winters, 1948-49 through 1951-52, notes taken on winter occurrences of several species of swallows in California add to the published knowledge of their winter status.

Tachycineta thalassina. Violet-green Swallow. Grinnell and Miller (Pac. Coast Avif. No. 27, 1944:272) consider it as "Essentially summer resident, March to September . . . and a few, probably not every year, present in mid-winter months, *southerly, and coastwise northwest to San Francisco Bay region.*" (Emphasis supplied.) However, this swallow has been observed during winter months in the Sierra Nevada foothills. At Hogan Reservoir, Calaveras County, several were seen on January 31, 1950. Farther north along the Sierra Nevada foothills, seven were seen at Mormon Island in Eldorado County on February 2, 1950. In the Central Valley, 20 were present at Tulare Lake, Kings County, on January 24, 1949, and several occurred at Lake Washington, Yolo County, to the west of Sacramento on February 11, 1950. To add a modern record to the one cited by Grinnell and Miller for the year 1885 at Sebastopol, Sonoma County, a few of these swallows were seen at Laguna de

Santa Rosa, Sonoma County, on February 13, 1950. Thus, Violet-green Swallows have been recorded each of three recent winters, and in areas not previously considered a part of the winter range of the species.

Stelgidopteryx ruficollis. Rough-winged Swallow. Its status is listed by Grinnell and Miller (*op. cit.*: 276) as a "Summer resident, April to August or September." Records in Audubon Field Notes include Soquel on March 14, 1950, and Los Gatos on March 20, 1949. All of these early dates are for the coastal region. My only winter record is for an inland area. A few were seen along the Colorado River northeast of Earp, San Bernardino County, on February 18, 1951.

Hirundo rustica. Barn Swallow. Grinnell and Miller (*op. cit.*: 277) give this swallow's status as "Summer resident; early April (or March at south) to September or early October." Records in Audubon Field Notes show other occurrences for mid-March as far north along the coast as Los Gatos and Soquel. My notes include observations coastwise as far north as Petaluma Creek, Sonoma County, and Tomales Bay, Marin County, March 19, 1949, and at Vallejo, Sonoma County, March 22, 1952. In the Sacramento Valley they were seen on November 29, 1950, at Wilton, Sacramento County, and at Gray Lodge Refuge, Butte County, January 4, 1950. Also, on March 19, 1951, they were seen at several places in the Sierra Nevada foothills of Calaveras County. In the observations for March just given, the birds occurred singly or in pairs and were occupying a habitat-niche typical of that occupied in summer, that is, wire-lines and fences adjacent to culverts or bridges. Such occurrences would indicate that these birds were not in migration.—Fred G. Evenden, Jr., *Sacramento, California, April 22, 1952.*

The Incubation Patch of the Clark Nutcracker.—Robert E. Bailey's recent paper on the incubation patch of passerine birds (Condor, 54, 1952:121-136) contributes substantially to a heretofore largely neglected phase of avian biology. The author states (p. 127) that an incubation patch was found in all nesting passerine females that he examined, but that he had never found an incubation patch on a male passerine bird. He presents a list of species of passerine birds in which he examined males and females collected during the breeding season. This list includes the Clark Nutcracker (*Nucifraga columbiana*).

It is possible that Bailey's failure to find an incubation patch on male Clark Nutcrackers may have been due to a vagary of sampling. Of 39 male Clark Nutcrackers two years old or older collected from central western Montana during March and April (height of the breeding season) of 1947, 1948, and 1949, ten had well developed incubation patches. Another nine showed light patches or remnants of patches. Nineteen of the 20 without incubation patches were collected in 1948 when only a small portion of the local population nested. During the same months of the same years, of 23 adult females collected, seven had well developed incubation patches, nine had light patches or remnants of patches, and seven showed no trace of an incubation patch. Five of the last mentioned seven were collected during the spring of 1948. In addition, I have not found any evidence that first-year Clark Nutcrackers breed. No first-year males or first-year females collected showed any trace of an incubation patch. Collections included 29 first-year males and 27 first-year females taken during March and April of 1947 and 1949 (no first-year nutcrackers were collected during March and April of 1948).

The incubation patches of the male Clark Nutcrackers were as well developed as those of females of the same species. Histological examination reveals, in the well developed incubation patches of both males and females, the extensive edema and vascularity described by Bailey. A more complete account of reproduction in the Clark Nutcracker is in preparation and will appear subsequently. This investigation was made possible in part by funds and facilities provided by the Department of Zoology and Biological Station, Montana State University, and in part by funds provided for biological and medical research by the State of Washington Initiative Measure No. 171.—L. R. Mewaldt, *Laboratory of Zoophysiology, State College of Washington, Pullman, Washington, May 30, 1952.*

Audible Flight of Great Horned Owls.—Loye Miller's intensely interesting article on auditory recognition of predators (Condor, 54, 1952:89-92) brings to mind an experience of mine. On August 29, 1936, I heard two Great Horned Owls (*Bubo virginianus*) hooting in broad daylight at about 6:30 a.m. while I was standing on the east edge of the Arroyo Seco in Pasadena, California. At the spot in question the arroyo was rather broad and supported but low, open vegetation. The high, steep banks, however, were densely vegetated. The two owls were flying close to the shrubbery of the

west wall and but a few feet above the floor. The noise of their wing-beats was clearly audible. I estimated that I was almost a hundred yards distant, airline.

Since then, in over 15 years, in spite of many attempts, I have failed to hear any noise from the wing-beats of an owl in full flight. On March 10, 1945, however, in Belmont, Massachusetts, when my head was about two feet distant from a Saw-whet Owl (*Aegolius acadicus*), it took off out of a Norway pine and flew some 20 feet to another pine. The first four or five wing-beats were perfectly audible, but sound ceased as the bird acquired momentum, and no additional sound was heard as the bird entered the second pine. I scaled this latter tree, flushing the bird when my head was three feet distant. Again I heard the several initial wing-beats plainly. A friend on the ground, about 30 feet away, was able also to hear these initial wing-beats.—WENDELL TABER, *Cambridge, Massachusetts, June 7, 1952.*

Additional Comments on Philippine Birds and a New Record from the Archipelago.—A specimen of *Ardeola bacchus* (Bonaparte) from Luzon in the Hachisuka Collection appears to represent a first record of this species from the Philippine Archipelago.

In their recent paper, "Undescribed and Newly Recorded Philippine Birds" (Am. Mus. Nov., no. 1545, Feb. 3, 1952), Manual and Gilliard record several interesting specimens among which is an adult male *Ptilinopus leclancheri leclancheri,* taken on Pujeda Island off Mindanao, purporting to be an extension of range for this species to the Mindanao region. There is a male *Ptilinopus l. leclancheri* taken at Davao, Mindanao Island, in the Hirazawa Collection, part of which was purchased by Marquess Hachisuka. This specimen was reported by Hachisuka (Tori, 11, 1941:63-64) as the first specimen collected in the southern Philippine Archipelago.

Delacour (Am. Mus. Nov., no. 1497, April 3, 1951) in his review of some of the species of *Coracina,* points out quite rightly that *Edolisoma* should be synonymized with *Coracina,* as the sole character seems to be a slender bill, which varies widely within the representatives of the latter genus. This creates the need for a new name for a Philippine species. Steere, in "A List of the Birds and Mammals Collected by the Steere Expedition to the Philippines," privately published at Ann Arbor, Michigan, July 14, 1890, describes *Artamides panayensis* (from Guimarás, Panay, and Masbate islands) on page 14. This is his species 125. A few lines farther on this same page, he describes *Edolisoma* (*Graucalus*) *Panayensis* from Guimarás and Panay islands. This is his species 128.

The first species is now considered to be *Coracina striata panayensis.*

The second species, until now considered to be *Edolisoma panayense* (Steere), I hereby rename *Coracina ostenta.*

It is perhaps worth noting that in the list of "Publications on Philippine Birds, 1945 through 1951," whch appears at the end of Messrs. Manuel and Gilliard's paper (*loc. cit.*), they failed to cite a paper describing a new shrike, *Lanius validirostris hachisuka,* from Mindanao (Ripley, Bull. British Ornith. Club, 69, 1949:121-122).—S. DILLON RIPLEY, *Yale University, New Haven, Connecticut, June 12, 1952.*

The Harlan Hawk in the Cariboo District, British Columbia.—In British Columbia the Harlan Hawk (*Buteo harlani*) has been known as a nesting member of the avifauna of the Boreal Forest biotic area of the far north. Munro and Cowan (Brit. Columbia Prov. Mus. Spec. Publ. No. 2, 1947:83) list only two specimen records for the southern part of the province, both of them taken during the autumn migration. It is accordingly of some interest that I have recently acquired three specimens in the general vicinity of Williams Lake, B. C., in the Cariboo Parklands biotic area. Two of these, an adult female shot near 153-Mile House and a male taken eight miles away at Williams Lake, were obtained on April 15, 1950, and April 26, 1950, respectively. The third specimen, an adult female, was taken on September 13, 1951, during the autumn hawk migration. It is noteworthy that the female taken on April 15 contained eggs two-thirds developed.—LEO JOBIN, *Williams Lake, British Columbia, December 10, 1951.*

Song in Hand-raised Meadowlarks.—From Dr. Loye Miller's recent note (Condor, 54, 1952: 173), it is plain that I did not make myself clear as to the songs of the two hand-raised *Sturnella magna* with which I am acquainted. He said that my "hand-reared meadowlarks do not sing the normal song of the species . . . . I am strongly tempted therefore to postulate that the aberrant vocaliza-

tions of certain cage bred individuals of native species [including W. E. D. Scott's Baltimore Orioles] are possibly due to malformations resulting from our inability to duplicate the normal diet . . . ."

The Eastern Meadowlark at the Trailside Museum, River Forest, Illinois, sings a fair song of the species. My bird has half a dozen good meadowlark songs, but also several others that differ in quality. The "meadowlark" songs of both of these birds came to me as a surprise, because of the experience of Dr. George M. Saunders who raised both Eastern and Western meadowlarks some twenty years ago. He wrote me: "None of my meadowlarks raised in Oklahoma City knew the songs of their species." One raised near a Cardinal (*Richmondena cardinalis*) adopted the latter's song. The song of Scott's Eastern Meadowlark "was quite dissimilar to that of a wild meadowlark" (Science, 19, 1904:957-959). In contrast to Saunders' birds, both of the Illinois meadowlarks in question had ample opportunity to hear Starlings, and one of the commonest imitations in the repertoire of *Sturnus vulgaris* in this region is that of the Eastern Meadowlark's song. My bird had the advantage of a linguistically-gifted tutor and many of the abberant songs we now hear in our house closely resemble songs heard from this Starling that lived across the street during the first two years of the meadowlark's life. In view of the evidence from Saunders and Scott against inheritance of song in meadowlarks, I believe these two Illinois birds learned their "meadowlark" songs from Starlings.

In some species songs are innate, while in others they have to be acquired; in birds of the latter class the tendency to adopt the species song is present, for they quickly learn it when given the right opportunity. For further discussion see Nice, Transactions of the Linnaean Society of New York, 6, 1943:133-143, and Thorpe, Ibis, 93, 1951:264-266.—Margaret M. Nice, *Chicago, Illinois, June 6, 1952.*

The Influence of Food Abundance on the Over-wintering of Pine Grosbeaks at College, Alaska.—My observations for two winters, coupled with data from local informants of long residence, indicate that the Pine Grosbeak (*Pinicola enucleator*) regularly over-winters in the vicinity of Fairbanks and College, Alaska, but in highly varying numbers, apparently depending upon the abundance of winter food. Throughout the winter of 1949-50 from October 1 on, grosbeaks were seen frequently in the environs of College. On February 19, a flock of about fifty grosbeaks was discovered feeding on oats in a small field situated on a hill about one-half mile back of the Fairbanks Country Club. I would estimate this field to be about twenty-five or thirty acres in size. The grain had been cut and shocked, but for some reason it was left standing in the field and consequently was more or less exposed above the snow-cover throughout the winter. Also, the shocks were frequently broken into by moose (*Alces gigas*), further exposing the grain for the grosbeaks. On frequent trips to this field throughout the rest of the winter, grosbeaks were nearly always to be found, the numbers usually varying between fifty and one hundred birds. Of two adult females, five adult males, and two immature males collected between February 19 and March 5 on this field, all had crops filled with oats and all were quite fat. It is my belief that most, if not all, of the grosbeaks in the College area that winter were relying principally upon this field for their winter food.

In the winter of 1950-51 no such store of food was available locally, and very few grosbeaks were recorded. Several were heard but not seen near the Chena Pump Station on March 10. Two were seen near Cleary Summit on the Steese Highway on March 25, and that same day Ed Huizer, a graduate student at the University of Alaska, reported a "large" flock along the Eight-mile Ski Trail, which passes through the area where the birds had been so common the previous winter. These birds, however, were probably returning "migrants."

Correspondence from observers watching in the College area during the winter of 1951-52 indicates that there is again a scarcity of grosbeaks with a corresponding lack of local food in the fields, although there was an excellent spruce-cone crop throughout the interior during the preceding summer.

These data strongly support the conclusion that the highly localized abundance of food provided by the oat field in the winter of 1949-50 was responsible for the successful over-wintering of a flock of Pine Grosbeaks probably somewhat in excess of one hundred individuals. D. W. Snow (Ibis, 94, 1952:135) in his recent excellent discussion of the winter avifauna of Arctic Lapland lists the Pine Grosbeak among those species that regularly winter in that region and that are independent of man's presence for so doing. This also holds for the species in interior Alaska, but here, apparently, effects of human occupation can augument the numbers that are able to over-winter successfully.—Tom J. Cade, *Alaska Cooperative Wildlife Research Unit, College, Alaska, May 15, 1952.*

Porcupine Quill Fatal to Jay.—The Steller Jay (*Cyanocitta stelleri*) shown in the accompanying photograph was found dead in an apple orchard near Paonia, Colorado, on April 7, 1952. The yellow-haired porcupine (*Erethizon epixanthum*) quill, of which the posterior portion is visible, penetrates the skin at the commissural point of the bill (fig. 1) and runs under the skin to the point

Fig. 1. Steller Jay found dead with porcupine quill penetrating skin and reaching point indicated by arrow.

indicated by the arrow. The quill does not pass through a vital organ which suggests that starvation was the cause of death. I examined the gizzard and found it nearly full of small grain husks, but there were no kernels. Decomposition made it impossible to determine the condition of the bird, but the body appeared to be emaciated.

Presumably the jay picked up the quill while scavenging on or near a dead porcupine or harassing a living one. Lano (Auk, 39, 1922:258-259) reported a similar condition in a Golden Eagle (*Aquila chrysaëtos*) which had several quills in its breast and mouth and apparently had starved. The photograph was taken by M. F. Fountain.—HOMER V. GRIFFIN, *Paonia, Colorado, April 28, 1952.*

NOTES AND NEWS

J. S. Appleton, member of the Cooper Ornithological Club since 1901 and past president of the Southern Division.

Officers of the Cooper Ornithological Club presenting a bound volume of letters of appreciation to W. Lee Chambers from his friends, shortly after publication of the September-October issue of The Condor. Left to right, Ed N. Harrison, J. R. Pemberton, Mr. Chambers, C. V. Duff, and W. J. Sheffler.

The painting of the White-winged Dove (*Zenaida asiatica*) reproduced as the frontispiece of this issue is the nineteenth in the series of paintings by Andrew Jackson Grayson to appear in The Condor. This color plate was given by Mr. Samuel B. Mosher, to whom readers of the journal are indebted. Grayson prepared this painting in Mazatlán in November, 1868. The woody plant shown appears to be *Prunus capoli*, known to have been important to early Spanish explorers of western Mexico as a source of food.

At the meeting of the American Ornithologists' Union in Baton Rouge, Louisiana, on October 20, 1952, Robert W. Storer was appointed editor of the Auk. The Brewster Award was made to John T. Zimmer for his taxonomic work on South American birds, especially those of Perú. The officers for 1952 were re-elected. Other elections resulted in the following: new councilors, Jean Delacour, Harvey I. Fisher, Herbert L. Stoddard; fellows, Emmet R. Blake, Paul L. Errington, Elsie M. Naumburg, William H. Phelps, Robert W. Storer, and Albert Wolfson; corresponding fellows, Armando Dugand, J. D. Goodall, Alfred W. Johnson, and Rodolfo A. Phillipi; elective members: W. J. Baerg, A. J. Berger, W. B. Cartwright, H. L. Cogswell, J. C. Dickinson, H. C. Hanson, Margaret B. Hickey, M. B. Meanley, R. J. Newman, R. A. Paynter, Jr., P. B. Street, and G. G. Williams. The meeting in 1953 will be held in Los Angeles, California.

Identifications of plants appearing in Grayson's paintings published in this and previous issues of The Condor have been provided by Annetta M. Carter and Herbert L. Mason of the University of California Herbarium.

The annual index to The Condor was prepared this year by Anita K. Pearson, to whom the editors are grateful for this assistance.

PUBLICATIONS REVIEWED

THE BIRDS OF CRATER LAKE NATIONAL PARK. By Donald S. Farner. University of Kansas Press, September 3, 1952, xi + 187 pp., 16 figs., map, paper bound.

This publication is a full account of information currently available on the birds of Crater Lake Park, an area of 250 square miles typical of the southern Cascade Range of Oregon. The park extends from the ponderosa pine and Douglas fir forests at the 4000 foot level up to the timberline scrub of white-bark pine on the crater rim and on the highest peak at 8900 feet. Both

the humid and dry sides of the Cascade divide are included. Avian habitats, chiefly forest types, are informally though adequately characterized and figured, and the conspicuous birds of each are mentioned. The lake itself provides little attraction for water birds because of its depth, steep shores and lack of border and marsh vegetation. The introduction of fish in it has brought some fish-eating birds that may originally have been entirely absent. A nice bit of correlation is shown between the fluctuation through some ten years in numbers of fish in the lake and the numbers of Double-crested Cormorants present.

The accounts of species give for each form its status in the park, an indication of abundance, and the habitat and zonal occurrence. When available, notes on nesting, food and behavior are reported. As a consequence an ornithologist visiting the area for the first time gains a quite accurate picture of what to expect and where to look for it. The accounts are not uniformly rich in natural history detail because, as the author explains, data have been gathered through no coordinated field research program but for the most part by ranger naturalists, from 1926 on, who were occupied much of the time with the education of visitors. At the end of each account is a list of specimens with their data and present locations. A resumé of observational evidence follows this, the items in it selected to represent stations, dates, activities, and numbers. These resumés are sometimes longer than necessary for the information they impart, but the reviewer thinks that it is better to err on the side of giving such detail than to suppress the basis for generalizations. Occasionally the discussion of the possible occurrence of subspecies as yet unrecorded in the park seems overdone, unless it serves to show how very much needed is further careful collecting in such an area.

Dr. Farner is to be commended for a painstaking job of assembling scattered evidence in addition to the data drawn from his own experience of eight seasons in the area. The work is accurate and is essentially free of typographical errors. It will serve importantly in the interpretive program in the national park and will be a constantly useful reference for information on the birds of southern Oregon.—Alden H. Miller.

COOPER CLUB MEETINGS

ANNUAL BUSINESS MEETING, 1952

The first session of the annual meeting of the members of the Cooper Ornithological Club (a corporation) was called to order by President J. R. Pemberton in Morrison Auditorium, California Academy of Sciences, San Francisco, California, at 10:15 a.m., May 9, 1952.

The minutes of the meeting of 1950 were read and approved. The following committees were appointed: Committee to examine proxies—C. G. Sibley, Wade Fox, Jr., and A. R. Phillips; committee on nominations—Ian I. McMillan, Junea W. Kelly, and R. T. Orr. The meeting was then adjourned until May 10.

The second session of the annual business meeting was called to order by President J. R. Pemberton at 9:30 a.m., Saturday, May 10, in Morrison Auditorium, California Academy of Sciences, San Francisco, California. Dr. Charles G. Sibley, chairman of the proxy committee, reported 82 members present in person and proxies for 811. A quorum was declared present. Mr. McMillan, reporting for the nominating committee, presented the following names for nomination to the Board of Directors: C. V. Duff, Ed N. Harrison, J. M. Linsdale, F. A. Pitelka, A. H. Miller, J. R. Pemberton, W. J. Sheffler, K. E. Stager, and J. C. von Bloeker, Jr. A unanimous ballot was proposed and cast in favor of election of the entire slate of nominated directors.

The following applications for membership were read: Mr. Larry E. Chapman, 3822 Randolph Ave., Oakland 2, California, and Mr. Peter Stettenheim, 1103 E. Washington St., Ann Arbor, Michigan, both proposed by Mr. C. V. Duff.

Proposals for the election of Walter K. Fisher and Clark P. Streator to honorary membership were read. It was moved and seconded that a unanimous ballot be cast in favor of the two names. Motion was passed.

The president then brought up the matter of changing the name of the organization from Cooper Ornithological Club to that of Cooper Ornithological Society. Considerable discussion relative to the change ensued and an explanation of the proxy was made. The resolution passed by the Board of Directors approving the change of name was read by the secretary. It was then moved and seconded that the resolution be adopted by the membership. The motion was passed with but one dissenting vote from the floor. Twenty-eight proxies voting against the change still left 864 members in favor of the change. This vote constituted a majority as the official membership of the Club was 1423 members at that time.

Mr. C. V. Duff, business manager, presented a brief report of the financial condition of the Club.

Adjourned.—Kenneth E. Stager, *Secretary.*

INDEX TO VOLUME 54

A

Acanthis, 54
  linaria, 245
Accentor, Alpine, 109
  Mountain, 109
Accipiter bicolor, 349
  cooperii, 89, 349
  erythronemius chionogaster, 283
  gentilis, 89
  nisus nisosimilis, 103
  soloensis, 103
  striatus, 283-289, 349
  striatus chionogaster, 283-289
  striatus erythronemius, 283-289
  striatus fringilloides, 283-289
  striatus madrensis, 285-289
  striatus perobscurus, 283-289
  striatus salvini, 283-289
  striatus striatus, 283-289
  striatus suttoni, 283-289
  striatus velox, 283-289
  striatus venator, 283-289
  striatus ventralis, 283-289
Actitis hypoleucos, 104
  macularia, 164, 350
Aegithalos caudatus, 107
Aëronautes saxatalis, 351
Agelaius phoeniceus, 29, 128, 151, 149
  tricolor, 189
Aimophila rufescens, 354
  ruficeps, 354
Aix sponsa, 204, 348-349
Ajaia ajaja, 208
Alauda arvensis, 106
Alcedo atthis, 105
Alcorn, J. R., and Marshall, David B., additional Nevada bird records, 320
Alectoris graeca, 321
Aletornis nobilis, 175
  venustus, 175
Amadon, Dean, and Phillips, Allan R., some birds of northwestern Sonora, Mexico, 163
Amazilia candida, 351
  cyanocephala, 351
  yucatanensis, 351
Amazona autumnalis, 350
  finschi, 118
  ochrocephala, 350
  virdidigenalis, 350
Amblycercus holosericeus, 353
Ammodramus bairdii, 167
Amphispiza bilineata, 167
Anas, 68
  acuta, 319, 349
  carolinensis, 52, 298
  clypeata, 68
  crecca, 349
  cyanoptera, 68, 320, 349
  discors, 67-68, 349
  platalea, 68
  platyrhynchos, 103, 298, 349, 358
  querquedula, 68
  rhynchotis, 68
  rubripes, 65
  smithi, 68
  sponsa, 65-66
  strepera, 349
Anderson, Morris P., and Dollahite, Ned, a new nesting record of the cinnamon teal in Humboldt County, California, 320
Anhinga anhinga, 349
Anser fabalis, 103
Anthracothorax prevostii, 351
Anthropoïdes, 205
Anthus spinoletta, 54, 61, 109, 166
  spragueii, 61, 166
Antshrike, Mexican, 348
Aphelocoma coerulescens, 90, 128, 160-162, 208
  coerulescens texana, 208
  ultramarina, 90, 352
Aquila chrysaëtos, 318, 319, 364
  depredator, 175
Aquilavus, 175
Apus pacificus, 105
Aracaris, Collared, 139
Ara militaris, 113, 350
Aratinga astec, 350
  holochlora, 350
Arborophila, 299
Archaeophasianus, 175
Archaeopsittacus, 175
Archaeornis, 84-87
Archilochus colubris, 351
Ardea, 80-81
  amissa, 175
  cinerea, 102
  herodias, 318, 349
Arenaria interpres, 53
Arny, Samuel A., taxonomic status of the bank swallow of North America, 356
Arremonops rufivirgatus, 354
Asio flammeus, 54, 317, 358
  otus otus, 105
Astrapia mayeri, 334
  stephaniae, 334
Asyndesmus lewis, 164, 244
Atlapetes albinucha, 354
  brunnei-nucha, 354
  pileatus, 354
  pileatus dilutus, 312
  pileatus pileatus, 312
Attebery, Howard R., willet eats jack smelt eggs, 321
Auklet, Paroquet, 52-53
Aulacorhynchus prasinus, 351
Auriparus flaviceps, 358
Australocorax, 175

Automolus leucophthalmus, 95
ochrolaemus excertus, 93-100
ochrolaemus pallidigularis, 95
Automolus, Chestnut-tailed, 93-100
White-eyed, 95
Avocet, 316
Aythya americana, 317, 349
marila, 52, 103, 204
valisineria, 321

B

Bailey, Robert E., the incubation patch of passerine birds, 121
Balanosphyra formicivora, 245, 315
Baldpate, 298
Balearica, 205
Bartholomew, George A., Jr., and Dawson, William R., body temperature in nestling western gulls, 58
Bartholomew, George A., Jr., and Howell, Thomas R., experiments on the mating behavior of the Brewer blackbird, 140
Basileuterus belli, 353
culicivorus, 94, 353
rufifrons, 353
Becard, Rose-throated, 348
Beidleman, R. G., current status of the starling in north-central Colorado, 173; confused enemy recognition, 318
Bee-eater, 197
Bishop-bird, 28, 40
Bittern, American, 317
Least, 113, 317
Blackbird, 89
Brewer, 3-47, 128, 140-151
Red-winged, 29, 33-35, 37, 39, 126, 128, 149, 339, 341
Rusty, 172
Tri-colored, 189
Yellow-headed, 14, 28, 33-39, 318
Bobolink, 34, 39
Bobwhite, Masked, 48-50
Bombycilla cedrorum, 166, 245, 353
Bonasa umbellus, 359
umbellus affinis, 359
umbellus phaia, 172, 359
umbellus umbelloides, 172, 359
umbellus yukonensis, 359
Borell, A. E., wood ibis in New Mexico, 115
Botaurus lentiginosus, 317
Brambling, 110
Brant, Black, 319
Branta nigricans, 319
Brauner, Joseph, reactions of poor-wills to light and temperature, 152
Brodkorb, Pierce, the types of Lambrecht's fossil bird genera, 174
Brooks, Allan, painting of gyrfalcon, opposite 237
Bryant, Harold C., additions to the check-list of birds of Grand Canyon National Park, Arizona, 320
Bubo, 92, 350
virginianus, 89-91
Bubulcus ibis, 103
Bucephala clangula, 103
Bulbul, Brown-eared, 101, 107
Bunting, Chestnut, 110
Corn, 30, 40
Indigo, 63
Lazuli, 63, 167
Meadow, 107, 110
Rustic, 110
Snow, 54, 62
Tristram, 110
Yellow-throated, 101, 110
Bush-tit, 128
Bustard, Great, 104
Buteo, 298
albonotatus, 90, 113, 349
buteo, 104
buteo burmanicus, 104
jamaicensis, 283, 349
lagopus, 52, 65
lineatus, 89
magnirostris, 349
nitidus, 349
rufinus, 104
swainsoni, 113, 358
Buteogallus anthracinus, 349
Butorides striatus, 102
virescens, 164, 349
virescens anthonyi, 164
Buzzard, Eurasian, 104
Upland, 104

C

Cade, Tom, notes on the birds of Sledge Island, Bering Sea, Alaska, 51; a hawk owl bathing with snow, 360; the influence of food abundance on the over-wintering of pine grosbeaks at College, Alaska, 363
Cairina moschata, 113
Calcarius lapponicus, 54
Callipepla, 299
squamata squamata, 310
Calocitta formosa, 90
Calothorax lucifer, 351
Calypte anna, 164
costae, 164
Camptostoma imberbe, 165
Campylopterus curvipennis, 351
Canvasback, 321
Capella, 105
gallinago, 350
Caprimulgus maculicaudus, 113
vociferus, 350
Caracara, 164, 310
Caracara cheriway, 349
Cardinal, 167
Carduelis spinus, 110
Carpodacus, 61
mexicanus, 29, 128-131, 173, 312, 354-355

mexicanus coccineus, 312
mexicanus centralis, 312
mexicanus frontalis, 61
mexicanus potosinus, 312
purpureus, 128, 320
Casarca ferruginea, 103
Casmerodius albus, 103, 317, 349
Cassidix mexicanus, 33, 353
Castlebuilder, Rufous-breasted, 93
Catbird, 204
Catharacta skua, 175
Cathartes aura, 164, 349
Catharus aurantiirostris, 204, 352
mexicanus, 352
occidentalis, 352
occidentalis olivascens, 311
Catherpes mexicanus, 352
Catoptrophorus semipalmatus inornatus, 321
Centurus aurifrons, 351
Cepphus columba, 52-53
Chaetura pelagica, 185
vauxi, 62
Chamaea fasciata, 117, 128
Chamaethlypis poliocephala, 353
Chat, 311
Palm, 197
Yellow-breasted, 67, 167
Charadrius alexandrinus, 174, 321
vociferus, 207, 350
Chen caerulescens, 320
rossii, 320
Chickadee, Black-capped, 174
Chestnut-backed, 115
Mountain, 128, 256
Childs, Henry E., Jr., hybrid between a shoveller and a blue-winged teal, 67
Childs, Henry E., Jr., and Mossman, Archie S., notes on the sexual behavior of two falcons, 207
Chlidonias nigra, 164
Chloris sinica ussuriensis, 109
Chloroceryle aenea, 351
amazona, 351
americana, 164, 351
Chlorospingus ophthalmicus, 354
Chlorospingus, Brown-headed, 348
Chlorostilbon canivetii, 351
Chlorura chlorura, 128
Chordeiles minor, 113
minor henryi, 310
Ciccaba virgata, 350
Circus cyaneus, 61, 349
Cissilopha beecheii, 90
Clangula hyemalis, 52, 319, 321
Clidastes, 73-88
Coeophloeus pileatus, 246
Cogswell, Howard L., Tyrannus melancholicus in Marin County, California, 117
Colaptes auratus, 243, 245
cafer, 91, 245, 341, 351
chrysoides, 91
Coleto, 55-57
Colinus, 299
virginianus, 350
virginianus ridgwayi, 48-50
Colonosaurus mudgei, 74
Columba calcaria, 175
fasciata, 164
flavirostris, 350
livia rupestris, 105
speciosa, 113
Columbigallina passerina, 350
talpacoti, 350
Colymbus, 121
auritus, 66-67, 314-315
auritus auritus, 315
auritus cornutus, 315
caspicus, 315
cornutus, 315
dominicus, 349
grisegena, 314
Combellack, C. R. B., the nesting span in the southern Willamette Valley, Oregon, 64
Congdon, Russell T., nesting of the Hudsonian godwit at Churchill, Manitoba, 290
Contopus pertinax, 352
virens, 352
Coot, European, 121
Coragyps, 349
atratus, 359
Cormorant, Double-crested, 163
Pelagic, 52
Corvus brachyrhynchos, 318
corax, 54, 165, 352
corone orientalis, 106
cryptoleucus, 310
frugilegus pastinator, 106
larteti, 175
levaillantii mandschuricus, 106
monedula, 106
Coturnix coturnix, 104
Cowbird, 29, 33, 34, 149, 208
Common, 359
Bronzed, ~~321~~
Red-eyed, ~~167~~
Shiny, ~~205~~
Crane, 104
Little Brown, 205-206
Sandhill, 52
White-naped, 104
Crax, 299
Crittenden, Don N., and Killpack, Merlin L., starlings as winter residents in the Uinta Basin, Utah, 338
Crocethia alba, 359
Crossbill, Red, 200-203
Crotophaga sulcirostris, 350
Crow, American, 318
Carrion, 101, 106
Jungle, 101, 106
Crow-tit, 107
Crypturellus cinnamomeus, 349

Cuckoo, Eurasian, 105
Striped, 169
Cuculus, 114
canorus, 105
canorus bakeri, 114
saturatus horsfieldi, 114
Curl, A. Laurence, chestnut-backed chickadee in the Sierra Nevada, 115
Curlew, Hudsonian, 62
Cyanerpes cyaneus, 353, 355
Cyanocitta cristata, 246
stelleri, 90, 128, 174, 352, 364
Cyanocompsa parellina, 354
Cyanolyca cucullata, 352
Cyclarhis gujanensis, 353
Cyclorrhynchus psittacuta, 52, 53
Cygnus cygnus, 103
Cynanthus latirostris, 164, 351
Cypseloides niger borealis, 310
Cyrtonyx montezumae, 209
montezumae mearnsi, 298
tedfordi, 298-299

D

Dactylortyx thoracicus, 350
Davis, David E., Leconte sparrow in western Montana, 115
Davis, John, a second November nest of the California thrasher, 116
Davis, L. Irby, winter bird census at Xilitla, San Luis Potosí, México, 345
Dawson, William R., and Bartholomew, George A., Jr., body temperatures in nestling western gulls, 58
Deignan, H. G., the earliest name of the Korean tree sparrow, 171
Delacour, Jean, the pheasants of the world, a review by A. H. Miller, 70
Dendragapus fuliginosus, 111
Dendrocopos, 274, 275
albolarvatus, 255, 275
borealis, 275
major, 106, 244
nuttallii, 245, 275
pubescens, 275
scalaris, 275, 320, 351
scalaris graysoni, 69
villosus, 249, 351
Dendroica aestiva, 62-63, 353, 355
auduboni, 128, 166, 353
coronata, 353
dominica, 353
fusca, 353
graciae, 311, 353
magnolia, 353
nigrescens, 166, 353, 355
occidentalis, 320, 353
townsendi, 63, 353
virens, 353
Dendronanthus indicus, 109
Dendrortyx, 299
barbatus, 350
Dickcissel, 320
Dives dives, 354
Dixon, Keith L., scrub jay in Bexar County, Texas, 208
Dolichonyx oryzivorus, 34
Dollahite, Ned, and Anderson, Morris P., Jr., a new nesting record of the cinnamon teal in Humboldt County, California, 320
Dotterel, 53
Dove, Mourning, 355, 358
Rock, 101, 105
Rufous Turtle, 101, 105
White-winged, 164, 355, 358, 365
Dowitcher, 111, 112
Dryocopus lineatus, 351
Duck, American Golden-eye, 172
Black, 65
Greater Scaup, 52, 101, 103, 204
Harlequin, 52, 172
Lesser Scaup, 172
Muscovy, 113
Redhead, 172
Ruddy, 113, 164, 172, 298
Wood, 65-66, 204, 348
Dulus dominicus, 197
Dumetella carolinensis, 204, 352

E

Eagle, Golden, 318, 319, 364
White-tailed Sea, 101, 104
Eberhardt, Robert L., northern phalaropes and Xantus murrelet associated with fishes, 314
Egret, American, 317
Cattle, 103
Great White, 101, 103
Snowy, 164, 317
Egretta thula, 317
Eider, Pacific, 52
Elanoides forficatus, 113
Emberiza calandra, 30
cioides, 110
cioides castaneiceps, 110
cioides weigoldi, 110
elegans elegans, 110
rustica rustica, 110
rutila, 110
tristrami, 110
Emlen, John T., Jr., social behavior in nesting cliff swallows, 177
Empidonax, 352, 355
difficilis, 128, 352, 355
griseus, 165
hammondii, 165
wrightii, 320
Endomychura hypoleuca, 314
Eophona migratoria, 109
Eremophila alpestris, 61, 165
alpestris adusta, 165
alpestris leucolaema, 165

alpestris occidentalis, 165
Ereunetes mauri, 317
Ergaticus ruber ruber, 311
Erithacus rubecula, 140
Erolia bairdii, 53, 358
melanotos, 53
ptilocnemis, 52
Eudromias morinellus, 53
Eugenes fulgens, 351
Euphagus carolinus, 172
cyanocephalus, 3-47, 128, 140-151, 354
Euplectes hordeacea, 28, 40
Eupoda montana, 204
Eurystomus orientalis, 106
Euthlypis lachrymosa, 353
Evenden, Fred G., Jr., additional bird records for Nevada, 174; winter status of swallows in California, 360

F

Falco albigularis, 207, 349
columbarius, 113, 349
femoralis, 310
mexicanus, 89
peregrinus, 174, 317, 349
rusticolus, 323
sparverius, 207, 264, 349
tinnunculus, 104
tinnunculus interstinctus, 104
Falcon, Aplomado, 310
Bat, 207
Peregrine, 174
Prairie, 89
Farner, D. S., the birds of Crater Lake National Park, a review by A. H. Miller, 365
Fennell, Chester M., some observations on the birds of southern Korea, 101
Finch, Black Rosy, 61-62
Gray-crowned Rosy, 172
House, 29, 128-131, 173, 312, 355
Purple, 128, 320
Rosy, 34
Weaver, 197
Fisher, Harvey I., the validity of the fossil crane Grus nannodes, 205
Flicker, 254
Gilded, 91
Red-shafted, 91, 174, 245, 264, 341
Yellow-shafted, 243
Florida caerulea, 349
Flycatcher, Alder, 355
Arizona Crested, 170
Ash-throated, 170
Beardless, 165
Gray, 165
Gray-spotted, 108
Hammond, 165
Least, 355
Japanese Blue, 108
Japanese Paradise, 101, 108
Pied, 39
Vermilion, 165, 318
Western, 128, 172, 355
Wright, 320
Yellow-bellied, 355
Fox, Wade, behavioral and evolutionary significance of the abnormal growth of beaks of birds, 160
Fratercula corniculata, 52, 53
Fregata magnificens, 113
Fringilla montifringilla, 110
Frohling, Robert C., pomarine jaeger and Bonaparte gull in the Hawaiian Islands, 316
Fulica americana, 350
dejardini, 175
Fulicaletornis, 175

G

Gabrielson, Ira N., notes on Bonasa and Numenius in Alaska, 359
Gallicrex cinerea, 104
Gallinula chloropus, 350
Gallinuloides prentici, 175
Gallus longaevus, 175
Garganey, 68
Garrulus glandarius brandtii, 107
Gavia, 80, 81, 86, 87
adamsii, 102
arctica, 52
Geococcyx californianus, 350
Geothlypis nelsoni, 353
trichas, 353
trichas arizela, 167
trichas chryseola, 311
trichas occidentalis, 167
trichas riparia, 311
Gerandia, 175
Geranospiza nigra, 348, 349
Gilliard, E. Thomas, and Mayr, E., altitudinal hybridization in New Guinea honeyeaters, 325
Glaucidium, 92
brasilianum, 350
gnoma, 91-92
phalaenoides, 89
Godwit, Hudsonian, 290-291
Goldfinch, American, 167, 355
Arkansas, 312
Green-backed, 128
Golden-eye, Common, 101, 103
Goose, Bean, 103
Blue, 320
Emperor, 52
Ross, 320
Goshawk, 89
Chinese, 101, 103
Grackle, Boat-tailed, 33
Bronzed, 34, 35
Graculus littoralis, 175
Grassquit, Blue-black, 312, 355
Grayson, Andrew Jackson, painting of ladder-backed woodpecker, opposite 3; red-front-

ed parrot, opposite 73; Massena quail, opposite 177; white-winged dove, opposite 325
Grebe, Eared, 315
Horned, 66-67, 172, 314-315
Red-necked, 172
Greene, Earle R., Sabine gull at Mono Lake, California, 115
Greenfinch, Oriental, 109
Greenhalgh, Clifton M., food habits of the California gull in Utah, 302
Gregory, Joseph T., the jaws of the cretaceous toothed birds, Icthyornis and Hesperornis, 73
Grieb, Jack R., and Ryder, Ronald A., waterfowl records for north-central Colorado, 65
Griffin, Homer, porcupine quill fatal to jay, 364
Grosbeak, Black-headed, 64, 128, 160-162
Blue, 167, 312
Pine, 363
Grouse, Franklin, 169
Ruffed, 172, 359
Sooty, 111
Grus, 104, 205
canadensis, 52, 205-206
canadensis canadensis, 205-206
nannodes, 205-206
problematicus, 175
vipio, 104
Guan, Crested, 113
Guillemot, Pigeon, 52, 53
Guiraca caerulea, 354
caerulea deltarhyncha, 312
caerulea eurhyncha, 312
caerulea salicaria, 167
Gull, Black-tailed, 101, 105
Bonaparte, 316
California, 133-135, 175, 206-207, 299, 302-308
Eurasian Black-headed, 101, 105
Franklin, 310
Glaucous, 53
Heermann, 114, 175
Herring, 101, 105
Sabine, 115
Western, 58-59
Gullion, Gordon W., the Hudsonian curlew in Nevada, 62; recent bird records from southern Nevada, 204
Gyrfalcon, 323

H

Habia gutturalis, 354
rubica, 354
Halcyon pileata, 105
Haliaeetus albicilla, 104
Hamilton, G. Dale, English sparrow feeding young eastern kindbirds, 316
Hargeria, 74
Harpagus bidentatus, 137-139
bidentatus fasciatus, 137-139
Harrison, Ed, and Roberts, Frances, photograph of Sooty Grouse, 111
Haverschmidt, Fr., nesting behavior of the southern house wren in Surinam, 292
Hawfinch, Black-headed, 109
Hawk, American Rough-legged, 172-173
Black Crane, 348
Cooper, 89
Duck, 317
Eurasian Sparrow, 101, 103
Ferruginous Rough-legged, 172
Marsh, 61
Pigeon, 113
Red-shouldered, 89
Rough-legged, 52, 65
Sharp-shinned, 283-289
Sparrow, 207, 264, 347
Swainson, 113, 173, 358
Zone-tailed, 90, 113
Heliornis fulica, 350
Hemichelidon griseisticta, 108
Hemiura, 322
Henicorhina leucophrys, 352
leucosticta, 352
Heron, Black-crowned Night, 113
Gray, 101, 102
Great Blue, 318
Green, 164
Streaked, 101, 102
Tricolored, 113
Herpetotheres cachinnans, 349
Hesperornis, 73-88
crassipes, 74, 83
gracilis, 74, 80, 81
regalis, 74, 80-83
Hirundo daurica, 106
erythrogaster, 54
rustica, 106, 165, 183
Histrionicus histrionicus, 52
Hock, Raymond J., golden eagle versus red fox: predation or play?, 318
Hodges, James, two nestling robins with abnormal beaks, 359
Honeycreeper, Blue, 355
Howell, Thomas R., natural history and differentiation in the yellow-bellied sapsucker, 237
Howell, Thomas R., and Bartholomew, George A., Jr., experiments on the mating behavior of the Brewer blackbird, 140
Hummingbird, Allen, 268
Anna, 164
Broad-billed, 164
Calliope, 358
Rufous, 164
Hydranassa tricolor, 113, 349
Hylocharis leucotis, 351
Hylocichla guttata, 149, 151, 352
guttata guttata, 166
guttata nanus, 166
guttata oromela, 166
guttata slevini, 166

mustelina, 352
ustulata, 166
ustulata oedica, 166
ustulata ustulata, 166
Hypomorphnus urubitinga, 349

I

Ibis, Wood, 115
Icteria virens, 64, 353
virens auricollis, 311
virens tropicalis, 167, 311
Icterus bullockii, 354, 355
cucullatus, 354, 358
galbula, 34, 354
graduacauda, 354
gularis, 354
parisorum, 311, 354, 355
spurius, 354
Icthyornis anceps, 74, 78
dispar, 73-88
victor, 74
Iridoprocne albilinea, 352
bicolor, 183
Ixobrychus exilis, 113, 317

J

Jabiru mycteria, 113
Jabiru, 113
Jacana spinosa, 350
Jackdaw, 106
Jaeger, Parasitic, 53, 172
Pomarine, 53, 316
Jay, Beechey, 90
Blue, 246
Brown, 348
Eastern Blue, 172
Eurasian, 101, 107
Magpie, 90
Mexican, 90
Scrub, 90, 128, 160-162, 208
Steller, 90, 128, 174, 364
Jobin, Leo, some bird records from the Cariboo District, British Columbia, 171; the European starling in central British Columbia, 318; the Harlan hawk in the Cariboo District, British Columbia, 362
Johnson, Ned K., additional records of the rough-legged hawk in Nevada, 65
Johnson, Ned K., and Richardson, Frank, supplementary bird records for Nevada, 358
Johnston, David W., and Norris, Robert A., winter record of the warbling vireo in California, 116
Jollie, Malcolm, comments on the check-list of the birds of Idaho, 172
Junco caniceps, 167
caniceps caniceps, 168
hyemalis, 54
hyemalis hyemalis, 167
oreganus, 123-136, 167
oreganus mearnsi, 167
oreganus montanus, 167, 168
phaeonotus, 354
Junco, Gray-headed, 167
Oregon, 123-136, 167
Slate-colored, 54, 167

K

Kestrel, Eurasian, 104
Killdeer, 207
Killpack, Merlin L., and Crittenden, Don N., starlings as winter residents in the Uinta Basin, Utah, 338
Kingbird, Cassin, 63, 117, 165
Eastern, 245, 316
Tropical, 117
Western, 63, 165
Kingfisher, Black-capped, 101, 105
Eurasian, 101, 105
Green, 164
Kinglet, Golden-crowned, 358
Ruby-crowned, 172
Kite, Black, 101, 103
Double-toothed, 137-139
Swallow-tailed, 113
Kittiwake, 53
Pacific, 52

L

Lagopus lagopus, 319
Lampornis amethystinus, 351
Lanius bucephalus, 109
cristatus, 109
Lark, Horned, 61, 165
Larus argentatus, 105, 350
californicus, 133-135, 206-207, 299, 302-308
crassirostris, 105
delawarensis, 350
heermanni, 114
hyperboreus, 53
occidentalis wymani, 58-59
philadelphia, 316
pipixcan, 310
ridibundus, 105, 122
schistisagus, 52
Lasky, William R., occurrence of the skua in southern California, 175; a case of avian tuberculosis in an immature avocet, 316
Laughlin, Robert M., a nesting of the double-toothed kite in Panamá, 137
Leaf-tosser, Guatemalan, 97, 98
Lepidocolaptes affinis, 351
Leptotila verreauxi, 350
Leucophoyx thula, 164, 349
Leucosticte atrata, 61-62
tephrocotis, 34
Ligon, J. Stokley, the vanishing masked bobwhite, 48
Limnodromus griseus, 111
Limosa haemastica, 290-291
Lincoln, Frederick C., an early specimen of the eastern fox sparrow from Colorado, 319

Linnet, 173
California, 61
Lobipes lobatus, 314
Loetscher, Frederick W., Jr., striped cuckoo fed by rufous-and-white wren in Panamá, 169; another unrecorded specimen of Neochloe brevipennis, 204
Longspur, Lapland, 54
McCown, 172
Loon, Arctic, 52
Common, 172
Yellow-billed, 101, 102
Lophodytes cucullatus, 66, 317
Lophortyx, 298
gambelii, 164
gambelii fulvipectus, 164
gambelii pembertoni, 164
Loxia, 359
curvirostra, 354
curvirostra bendirei, 200-203
curvirostra benti, 200-203
curvirostra grinnelli, 200
curvirostra sitkensis, 200-203
curvirostra stricklandi, 200-203
Lunda cirrhata, 52, 54
Lunk, William A., a hooded merganser from the late Pleistocene of Oklahoma, 316

M

Macaw, Green, 113
Magpie, Black-billed, 101, 102, 106
Yellow-billed, 90
Mallard, 101, 103, 298, 300, 358
Man-o'-war Bird, Magnificent, 113
Mareca americana, 298, 349
penelope, 358
Marshall, Davis B., and Alcorn, J. R., additional Nevada bird records, 320
Martin, Purple, 181, 189
Mayr, E., and Gilliard, E. Thomas, altitudinal hybridization in New Guinea honeyeaters, 325
Mead, Gertrude H., robin breeding in San Diego, California, 64
Meadowlark, Eastern, 167
Western, 128, 355
Megaceryle alcyon, 351
torquata, 351
Megapaloelodus, 296-298
connectens, 296-298
Megarynchus pitangua, 352
Melanerpes erythrocephalus, 244, 318
formicivora, 245, 351
Melanitta fusca, 116
Melanotis caerulescens, 352
Melidectes belfordi, 325-337
belfordi belfordi, 325-337
belfordi brassi, 325-337
belfordi griseirostris, 325-337
belfordi joiceri, 325-337
belfordi rufocrissalis, 325-337
belfordi kinneari, 325-337
belfordi stresemanni, 325-337
belfordi foersteri, 325-337
leucostephes, 325-337
Melirrhophetes, 325
Melospiza georgiana, 168
lincolnii, 61, 354
melodia, 41, 123, 128, 168, 268
melodia fallax, 168
melodia fisherella, 168
melodia montana, 168
melodia saltonis, 168
Mengel, Robert M., and Mengel, Jane S., Sprague pipit and black rosy finch in north-central Wyoming in summer, 61
Merganser, Hooded, 66, 317
Red-breasted, 52, 101, 103, 164, 172
Mergus serrator, 52, 103, 164
Merops, 197
Mewaldt, L. R., the incubation patch of the Clark nutcracker, 361
Micrastur ruficollis, 349
semitorquatus, 349
Micropalama himantopus, 111-112, 171
Microscelis amaurotis, 107
Miller, Alden H., review of "Mexican Birds," by G. M. Sutton, 69; review of "The Pheasants of the World," by J. Delacour, 70; the generic name of the white-bellied wren of Mexico, 322; review of "The Birds of Crater Lake National Park," by Donald S. Farner, 365
Miller, Loye, sun-bathing linnets, 61; auditory recognition of predators, 89; song in hand-reared birds, 173; the avifauna of the Barstow Miocene of California, 296
Milvus migrans, 103
migrans lineatus, 103
Mimus polyglottos, 352
Miocorax, 175
Miocorvus, 175
Miofulica, 175
Miogallus, 175
Miophasianus, 175
Miorallus, 175
Mitrephanes phaeocercus, 352
Mniotilta varia, 353, 358
Molothrus ater, 29, 149, 151, 208, 353, 359
ater artemisiae, 359
ater obscurus, 359
bonariensis, 295
Momotus momota, 351
Montgomery, Vester, Carolina wren and catbird in southern New Mexico, 204
Monticola solitarius, 108
Moreno-merceratia, 175
Mossman, Archie S., and Childs, Henry E., Jr., notes on the sexual behavior of two falcons, 207
Motacilla alba, 109
cinerea, 109

flava, 54
Murie, Olaus J., additional records of Cuculus in North America, 114
Murre, Northern, 52, 53
Common, 52, 53
Murrelet, Ancient, 172
Xantus, 314
Muscicapa hypoleuca, 39
Muscicapula cyanomelana, 108
Myadestes obscurus, 352
unicolor, 352
Mycteria americana, 115
Myiarchus cinerascens, 170
tyrannulus, 352
tyrannulus magister, 170
tuberculifer, 352
Myioborus miniatus, 353
miniatus miniatus, 311
Myiozetetes similis, 352
Myna, Red-cheeked, 109
Myopsittacus monachus, 197

N

Nannorchilus leucogaster, 322
Neochloe brevipennis browni, 204
Nice, Margaret M., song in hand-raised meadowlarks, 362
Nighthawk, 113, 310
Common, 318
Nisus pacificus, 288
Norris, Robert A., and Johnston, David W., winter record of the warbling vireo in California, 116
Nucifraga columbiana, 128
Numenius hudsonicus, 52, 62
phaeopus variegatus, 359
Nutcracker, Clark, 128
Nuthatch, Eurasian, 107
Pygmy, 128, 310
White-breasted, 256
Nycticorax nycticorax, 113
Nyctidromus albicollis, 350

O

Old-squaw, 52, 319, 321
Oligocorax, 175
Oporornis tolmiei, 166, 353
tolmiei intermedia, 167
Oreopeleia albifacies, 350
montana, 350
Oreortyx, 299
Oriole, Baltimore, 34, 35, 173
Black-naped, 101, 106
Bullock, 355
Hooded, 358
Scott, 311, 355
Oriolus chinensis, 106
Orr, Robert T., photograph of Franklin grouse, 169
Orr, Robert T., and Webster, J. Dan, notes on Mexican birds from the states of Durango and Zacatecas, 309
Ortalis pollicaris, 299
vetula, 350
Otis tarda dybowskii, 104
Otus, 92
asio, 91, 348, 350
bakkamoena ussuriensis, 105
flammeolus, 90
Oropendola, 39
Wagler, 31, 34
Ovenbird, 94
Owl, Barn, 310
Barred, 171
Burrowing, 348
Common Screech, 348
Flammulated, 90
Guatemalan Screech, 348
Horned, 89-91
Long-eared, 105
Oriental Screech, 105
Pigmy, 91-92
Screech, 91
Short-eared, 54, 317, 358
Spotted, 90
Oxyura jamaicensis, 113, 164, 298

P

Palaeoaramides, 175
Palaeociconia cristata, 175
Paleopicus, 175
Paloelodus, 296-298
Pandion haliaetus, 349
Panyptila cayennensis, 114
sanctihieronymi, 113
Paracorax, 175
Paragrus, 175
Parakeet, Green, 197
Paraortygometra, 175
Pararallus, 175
Parascaniornis, 174
stensiöi, 174
Paratrogon, 175
Parkes, Kenneth C., the races of the bald starling of the Philippines, 55; geographic variation in the horned grebe, 314
Parrot, Red-fronted, 118
White-crowned, 348
Partridge, Chukar, 321
Hungarian, 321
Parula pitiayumi, 353
Parus atricapillus, 174
gambeli, 128, 256
inornatus, 128
major, 107
rufescens, 115
varius, 107
wollweberi, 165, 352
wollweberi phillipsi, 165

Passer, 335
domesticus, 128, 316, 353
montanus dybowskii, 109, 171
montanus kaibatoi, 171
montanus montanus, 171
montanus orientalis, 171
montanus partim, 171
montanus saturatus, 171
Passerculus sandwichensis, 54
sandwichensis nevadensis, 320
Passerella ilaca, 128
iliaca iiaca, 319
Passerherbulus caudacutus, 115, 116
Passerina amoena, 63, 167
ciris, 354
cyanea, 63, 354
Pearse, Theed, notes on the occurrence and behavior of the stilt sandpiper on Vancouver Island, 111
Pelidna alpina, 317
Pemberton, J. R., Vaux swift on Santa Rosa Island, California, 62; inland record of the white-winged scoter from California, 116
Penelope, 299
purpurascens, 113
Pepper-shrike, Mexican, 348
Perdix perdix, 321
Petrochelidon, 198
pyrrhonota, 128, 177-199
Peucedramus olivaceus, 353
Phalacrocorax, 82
auritus, 163
destefanii, 175
femoralis, 175
olivaceus, 349
pelagicus, 52
vetustus, 175
Phalaenoptilus nuttallii, 152-159, 350
Phalarope, 172
Northern, 172, 314
Wilson, 172
Phasianus altus, 175
colchicus, 104
colchicus karpowi, 104
roberti, 175
Pheasant, Ring-necked, 101, 104
Pheucticus ludovicianus, 354
melanocephalus, 64, 128, 160-162, 354
Philacte canagica, 52
Philetaerus, 197
Phillips, Allan R., and Amadon, Dean, some birds of northwestern Sonora, Mexico, 163
Phoebe, Black, 128, 348
Say, 310
Phoenicopterus, 296-298
antiquorum, 297
Phoenicurus auroreus auroreus, 108
ochrurus, 39
Phloeoceastes guatemalensis, 351
melanoleucos, 138
Phylloscopus coronatus, 108
Piaya cayana, 350
Pica pica japonica, 106
nuttallii, 90
Picoides, 274, 275
arcticus, 172
tridactylus fasciatus, 172
Piculus aeruginosus, 351
Picus archiaci, 175
Pigeon, Band-tailed, 164, 172
White King, 133
Scaled, 113
Pinicola enucleator, 363
Pintail, 319, 347
Pionus senilis, 350
Pipilo, 335
fuscus, 128, 312, 354
fuscus potosinus, 312
fuscus perpallidus, 312
maculatus, 128, 167, 354
maculatus montanus, 167
Pipit, 54
American, 61
Sprague, 61, 166
Water, 109
Piranga bidentata, 354
flava, 354
leucoptera, 354
ludoviciana, 167, 354
rubra, 318, 354
Pitangus sulphuratus, 352
Platycarpus, 73-88
Platypsaris aglaiae, 351
Plectrophenax nivalis, 54, 62
Plegadis mexicana, 349
Pliogrus, 175
germanicus, 175
Plover, Black-bellied, 63
Golden, 170
Mountain, 172, 204
Snowy, 174, 321
Upland, 172
Pluvialis dominica, 170
dominica dominica, 171
dominica fulva, 171
Podiceps, 121
cristatus, 10
Podilymbus podiceps, 349
Polioptila caerulea, 352
Polyborus cheriway, 164, 310
Pooecetes gramineus, 61
Poor-will, 152-159
Porphyrula martinica, 350
Proardea, 175
Probalearica, 175
Progne subis, 189
Protogrus, 175
Prunella collaris, 109
montanella, 109
Psaltriparus minimus, 128
Psilorhinus morio, 352

Psittacus verreauxi, 175
Ptarmigan, Willow, 319
Pteroglossus torquatus, 139
Ptilogonys cinereus, 353
Puffin, Horned, 52, 53
Tufted, 52, 54
Puffinus leucomelas, 102
Pulich, Warren M., the Arizona crested flycatcher in Nevada, 169
Pursell, William M., and Williams, Laidlaw, aberrant Heermann gulls at Pacific Grove, California, 114
Pyrocephalus rubinus, 165, 318, 352
Pyrrhuloxia, 167
sinuata, 167

Q

Quail, California, 153
Gambel, 164
Massena, 209, 298
Mearns, 209, 298
Migratory, 102, 104
Scaled, 310
Quercyrallus, 175
Quiscalus aeneus, 34

R

Rallicrex, 174
kolozsvarensis, 174
Rallus arenarius, 175
christyi, 175
dispar, 175
major, 175
porzanoides, 175
Ramphastos brevicarinatus, 138
sulphuratus, 351
swainsonii, 138, 139
Raven, 54, 172
Common, 165
White-necked, 310
Recurvirostra americana, 316
Redhead, 317
Redpoll, 54, 245
Redstart, Black, 39
Painted, 115
Red-bellied, 311
Slaty-crowned, 101, 108
Red-wing, Tricolored, 38, 39
Regulus calendula, 352
satrapa, 358
Rett, Egmont Z., the robin nesting at Santa Barbara, California, 64; the painted redstart at Santa Barbara, California, 115
Rhodothraupis celaeno, 354
Richardson, Frank, a second record of the indigo bunting in Nevada, 63
Richardson, Frank, and Johnson, Ned K., supplementary bird records for Nevada, 358
Richmondena cardinalis, 354
Ridgwayia pinicola, 311
Riparia riparia, 183, 356, 357
riparia ijimae, 356, 357
riparia maximiliani, 356, 357
riparia riparia, 356, 357
Ripley, S. Dillon, additional comments on Philippine birds and a new record from the archipelago, 362
Rissa tridactyla, 52, 53
Roberts, Frances, and Harrison, Ed, photograph of sooty grouse, 111
Robin, 64, 128, 140, 359
Gray, 348
Jalapa, 348
Robin-Flycatcher, Japanese, 108
Rock-Thrush, Blue, 108
Roller, Oriental Broad-billed, 101, 106
Rollulus, 299
Rook, 106
Ryder, Ronald A., bird notes from southern Colorado, 317
Ryder, Ronald A., and Grieb, Jack R., waterfowl records for north-central Colorado, 65

S

Salpinctes obsoletus, 310
obsoletus latistasciatus, 311
obsoletus notius, 311
obsoletus obsoletus, 311
Saltator atriceps, 354
coerulescens, 354
Sanderling, 359
Sandpiper, Baird, 53, 358
Common, 104
Pectoral, 53
Red-backed, 317, 359
Spotted, 164
Stilt, 111, 112, 171
Western, 317, 359
Sapsucker, Red-breasted, 160, 172, 249
Williamson, 174, 246
Yellow-bellied, 237-282
Sarcops calvus, 55-57
calvus calvus, 55-57
calvus lowii, 56, 57
calvus melanotus, 55-57
calvus minorensis, 55-57
lowii, 55-57
Sayornis nigricans, 128, 352
phoebe, 352
saya saya, 310
Scardafella inca, 350
Schoeniophylax phryganophila, 169
Sclerurus guatemalensis, 97
Scoter, White-winged, 116
Seiurus aurocapillus, 94, 353
motacilla, 353
noveboracensis, 318, 353
Selasphorus rufus, 164
sasin, 268
Setophaga picta, 115, 353
Shearwater, Streaked, 102
Sheldrake, Ruddy, 103

Shoveller, 67, 68, 113
Common, 103
Shrike, Bull-headed, 109
Red-tailed, 109
Sialia sialis, 352
Sibley, Charles G., wren-tit attempts copulation with begging fledgling, 117; egg laid by killdeer frightened from nest, 207
Siphia mugimaki, 108
Siskin, Eurasian, 110
Pine, 167
Sitta carolinensis, 256
europaea, 107
pygmaea, 128
pygmaea chihuahuae, 310
Sittasomus griseicapillus, 351
Skua, 175
Skutch, Alexander G., life history of the chestnut-tailed automolus, 93
Skylark, 102, 106
Snipe, 105
Somateria, 319
v-nigra, 52
Sparrow, Baird, 167
Black-throated, 167
Black-chinned, 168, 312
Chipping, 128
English, 61, 128, 316
Eurasian Tree, 109
Fox, 128, 319
Golden-crowned, 168
Grasshopper, 172
Leconte, 115, 116
Lincoln, 61
Rufous-capped, 312
Savannah, 54, 320
Song, 37, 41, 123, 125, 128, 168, 268
Swamp, 168
Tree, 172
Vesper, 61
White-crowned, 40, 41, 123-136
White-throated, 245
Spatula, 68
clypeata, 67, 68, 103, 113, 349
Speotyto cunicularia, 348, 350
Sphyrapicus thyroideus, 174, 246, 275
thyroideus nataliae, 238
thyroideus thyroideus, 238
varius, 160, 237-282, 351
varius atrothorax, 238
varius daggetti, 237-282
varius nuchalis, 237-282
varius ruber, 172, 237-282
varius varius, 237-282
Spinus notatus, 354
pinus, 167
psaltria, 128, 354
psaltria psaltria, 312
tristis, 167, 354, 355
Spiza americana, 320
Spizella atrogularis, 168
atrogularis atrogularis, 312
passerina, 128, 354
Spoonbill, Roseate, 208
Sporophila aurita, 137
torqueola, 354
Squatarola squatarola, 63
Starling, 173-174, 321, 338-344, 358
Bald, 55-57
European, 318
Steel, Paul E., inland record of sanderling, 359
Stelgidopteryx ruficollis, 183, 352
Stellula calliope, 358
Stercorarius parasiticus, 53
pomarinus, 53, 316
Sterna hirundo, 182
Stoner, Emerson A., homing instinct in cowbird, 208
Storer, Robert W., variation in the resident sharp-shinned hawks of Mexico, 283
Streptopelia orientalis orientalis, 105
Streptoprocne zonaris, 348, 351
Strix, 92
varia varia, 171
Sturnella magna, 354
magna lilianae, 167
neglecta, 128
Sturnia philippensis, 109
Sturnus vulgaris, 173, 174, 318, 321, 338-344, 358
Suthora webbiana, 107
Sutton, George Miksch, Mexican birds, a review by A. H. Miller, 69
Swallow, Bank, 172, 183, 190, 197, 356, 357
Barn, 54, 165, 183, 198
Cliff, 128, 177-199
House, 106
Red-rumped, 101, 106
Rough-winged, 172, 183
Tree, 183
Violet-green, 64, 165, 183
Swan, Whooping, 101, 103
Swift, Black, 310
Chimney, 185
Collared, 348
Swallow-tailed, 113
Vaux, 62
White-rumped, 101, 105
Synallaxis, 97, 98
albescens, 169
erythrothorax, 93
spixi, 169

T

Taber, Wendell, audible flight of great horned owls, 361
Tachycineta thalassina, 64, 165, 183
Tanager, Summer, 318
Western, 64, 167
Tanagra affinis, 354
lauta, 354
musica, 354
Tangavius aeneus, 167, 311, 353

Tapera naevia, 169
Tapia, Guillermo José, black-crowned night heron breeds in heart of Mexico City, 360
Teal, Blue-winged, 67, 68
Cinnamon, 320
Green-winged, 52, 298, 300
Telmatodytes palustris, 39, 310
palustris plesius, 320
palustris pulverius, 320
Tern, Black, 164
Common, 182
Least, 172
Terpsiphone, 335
atrocaudata, 108
Thamnophilus doliatus, 351
Thrasher, Bendire, 165
Brown, 108
California, 116, 160-162
Crissal, 165
Curve-billed, 165, 311
Thraupis abbas, 354
episcopus, 354
Thripadectes rufobrunneus, 99
Thrush, Aztec, 311
Gray-backed, 108
Hermit, 149, 166
Mistle, 89
Nightingale, 311
Oriental Dusky, 101, 108
Siberian, 107
Swainson, 166
Thryomanes bewickii, 352
bewickii eremophilus, 165
Thryothorus ludovicianus, 204
modestus, 169
rufalbus, 169
rutilus, 352
Tiaris olivacea, 354
Tit, Great, 101, 107
Long-tailed, 107
Varied, 107
Titmouse, Bridled, 165
Plain, 128
Tityra inquisitor, 351
semifasciata, 351
Tordoff, Harrison B., notes on plumages, molts, and age variation of the red crossbill, 200
Toro, Miguel Alvarez del, new records of birds from Chiapas, Mexico, 112
Totanus flavipes, 111
melanoleucus, 111
Toucan, Swainson, 138, 139
Towhee, Brown, 128, 312
Green-tailed, 128, 320
Spotted, 128, 167
Toxostoma bendirei, 165
curvirostre celsum, 165, 311
curvirostre maculatum, 165
curvirostre palmeri, 165
dorsale, 165
dorsale coloradense, 166
longirostre, 352
redivivum, 116, 160-162
rufum, 108
Tree-hunter, Streaked, 99
Troglodytes aëdon, 59, 352
brunneicollis, 352
musculus, 292-295
musculus inquietus, 293
musculus intermedius, 293
troglodytes, 39, 107, 292
Trogon collaris, 351
elegans, 351
gallicus, 175
mexicanus, 351
mexicanus clarus, 310
violaceus, 351
Trogon, Coppery-tailed, 348
Gartered, 348
Jalapa, 348
Mexican, 310
Turdus assimilis, 352
grayi, 352
hortulorum, 108
infuscatus, 352
merula merula, 89
migratorius, 64, 128, 352, 359
naumanni, 108
naumanni eunomus, 108
sibiricus sibiricus, 107
viscivorus, 89
Turnstone, Ruddy, 53
Tyrannus melancholicus, 117, 352
melancholicus occidentalis, 117
tyrannus, 245, 316
verticalis, 63, 165
vociferans, 63, 117, 165
Tyto alba, 310, 350

U

Uria aalgae, 52, 53
lomvia, 52, 53
Uropsila, 322
leucogastra, 322
Urosphena squameiceps, 108

V

Veniliornis fumigatus, 351
Verdin, 358
Vermivora celata, 128, 353
celata lutescens, 166
celata orestera, 166
peregrina, 353
ruficapilla, 353
superciliosa, 353
virginiae, 320, 353
Vireo gilvus, 116, 128, 311
griseus, 204, 353
huttoni, 116, 166, 353
olivaceus, 320
solitarius, 353
solitarius cassinii, 166

solitarius pinicolus, 311
virescens, 353
Vireo, Hutton, 116, 166, 172
Red-eyed, 320
Solitary, 166, 311
Warbling, 116, 128, 311
White-eyed, 204
Volatinia jacarina, 312, 354, 355
Vulture, Black, 348
Turkey, 164

W

Wagtail, Forest, 101, 109
Gray, 101, 102, 109
Pied, 109
Yellow, 54
Walker, Kenneth M., northward extension of range of the acorn woodpecker in Oregon, 315
Warbler, Audubon, 128, 320
Black-and-white, 358
Black-throated Gray, 166, 355
Calaveras, 320
Crowned Willow, 108
Grace, 311
Hermit, 320
MacGillivray, 166, 320
Orange-crowned, 128, 166, 320
Pileolated, 62, 63, 167, 348
Red, 311
Short-tailed Bush, 101, 108
Stripe-crowned, 94
Townsend, 63
Virginia, 320
Yellow, 62, 63, 320, 355
Water-cock, 101, 104
Water-thrush, 172
Northern, 318
Waxwing, Cedar, 166, 245
Webster, J. Dan, and Orr, Robert T., notes on Mexican birds from the states of Durango and Zacatecas, 309
Whimbrel, Siberian, 359
Whip-poor-will, 113
White-eye, Oriental, 109
Widgeon, 358
Willet, 172, 321
Williams, Laidlaw, breeding behavior of the Brewer blackbird, 3; feeding behavior of golden plover in captivity, 170
Williams, Laidlaw, and Pursell, William M., aberrant Heermann gulls at Pacific Grove, California, 114
Wilsonia pusilla, 62, 63, 167, 353
Wisner, Robert L., land birds at sea, 62
Woodpecker, 315
Downy, 275
Golden-winged, 245
Great Pied, 106
Hairy, 249, 253, 254, 258
Ladder-backed, 69, 320
Lewis, 164
Pigmy, 101
Pileated, 246
Red-headed, 174, 318
White-headed, 255, 258
Wooten, William A., roseate spoonbill in Imperial County, California, 208
Wren, Bewick, 165
Carolina, 204
European, 292
Holarctic, 107
House, 59, 158, 255, 258
Long-billed Marsh, 39, 310
Marsh, 320
Rock, 310
Rufous-and-white, 169
Southern House, 292-295
White-bellied, 322
Winter, 39
Wren-tit, 117, 128

X

Xanthocephalus xanthocephalus, 28, 318
Xanthoura yncas, 352
Xema sabini, 115
Xenopicus, 274
Xenops minutus, 97
Xenops, Minute, 97
Xiphocolaptes promeropirhynchus, 351
Xiphorhynchus flavigaster, 351

Y

Yellow-legs, Greater, 111, 310
Lesser, 111, 112
Yellow-throat, 167, 311
Young, R. T., status of the California gull colony at Mono Lake, California, 206

Z

Zarhynchus wagleri, 31, 34
Zenaida asiatica, 164, 350, 355, 358
Zenaidura macroura, 350, 355, 358
Zonotrichia albicollis, 245
coronata, 168
gambeli, 168
leucophrys, 40, 41, 123-136
Zosterops palpebrosa, 109

Concerning Cooper Club Memberships and Subscriptions
Address C. V. DUFF, Business Manager,
1922 Tamarind Avenue, Hollywood 28, California

Send dues, address changes, and advertisements to
Jack C. von Bloeker, Jr., Treasurer,
161 West 121st St., Los Angeles 61, California

For Sale, Exchange, and Want Column—Each Cooper Club member is entitled to one short advertising notice in any issue of the Condor free. Notices of over 3 lines will be charged for at the rate of 25 cents per line.

WANTED—Typist with ornithological interest to prepare manuscripts; part time, Hollywood area. —DON BLEITZ, *Bleitz Wildlife Foundation, 1001 N. McCadden Pl., Los Angeles 38, Calif.*

FOR SALE—Henry, Birds of Ceylon (color pls.), parts I-IV, 1927–35, $15.00; Cayley, Australian Parrots (color pls.), 1938, $3.00; Barrett, Parrots of Australia, 1949, $2.50; Mathews and Iredale, Manual of Birds of Australia, 1921, $3.00.—F. HAVERSCHMIDT, *P. O. Box 644, Paramaribo, Surinam.*

WANTED—A soldier friend asked me to procure for him Austin's "Birds of Korea" for a reasonable price.—J. J. HICKEY, *424 University Farm Place, Madison 5, Wisconsin.*

FOR SALE—Mammals of Panama, Goldman, $4.00; North American Fauna, nos. 1-50, $65.00; Bent's Life Histories, no. 107, $25.00; Bendire's Life Histories, 2 vols., $6.00; Ridgway's Birds of North and Middle America, vols. 1-8 (green cloth), $35.00; Bailey, Birds of New Mexico, $10.00; postage extra.—LAURENCE M. HUEY, *Natural History Museum, Balboa Park, San Diego 1, Calif.*

FOR SALE—Bailey, Raptorial Birds of Iowa, 1918, $2.25; Bird-Banding Notes, vols. 1 and 2, 1922–1938, mimeographed, $10.00; Goldman, Biological Investigations in Mexico, 1951, 476 pp., 70 pls., map; postpaid in U. S.—H. H. T. JACKSON, *U. S. National Museum, Washington 25, D. C.*

WANTED—Complete set, E. T. Seton's Lives of Game Animals.—W. V. MAYER, *Department of Zoology, University of Southern California, Los Angeles 7, Calif.*

WANTED—Copies of The Condor, vol. 27, no. 2; please state price.—MRS. M. S. RAY, *171 San Benito Way, San Francisco 27, Calif.*

FOR SALE—Complete set of The Nuttall Bulletin and The Auk, as follows: Nuttall Bulletin, vols. 1-8, 1876–1883 (black cloth); Auk. vols. 1-10, 1884–1893 (same binding); vols. 11-33, 1894–1916 (½ black leather); vols. 34-69, 1917–1952 (paper). This, a beautiful set, formerly owned by the late Joseph Mailliard; $325.00, postpaid in the United States.—W. LEE CHAMBERS, *R. R. 1, Box 294, Topanga, Calif.*

BOOKS FOR SALE—Catalogue No. 10, Natural History Books, now ready for mailing.—W. R. HECHT, *3965-A Shenandoah, St. Louis 10, Mo.*

FOR SALE—Birds of Massachusetts, 3 vols., by Forbush; and Florida Bird Life, by Howell. Make offer.—F. A. PITELKA, *Museum of Vertebrate Zoology, University of California, Berkeley 4, Calif.*

WANTED—Contributions or donations of moderately fresh (non-weathered) owl pellets of all species in quantity; please correspond before making shipments.—JACK C. VON BLOEKER, JR., *Division of Natural Sciences, Los Angeles State College, 855 N. Vermont Ave., Los Angeles 29, Calif.*

CONTENTS OF RECENT ISSUES OF THE CONDOR

September-October, 1952

Natural History and Differentiation in the Yellow-bellied Sapsucker *Thomas R. Howell*
Variation in the Resident Sharp-shinned Hawks of México.....*Robert W. Storer*
Nesting of the Hudsonian Godwit at Churchill, Manitoba.....*Russell T. Congdon*
Nesting Behavior of the Southern House Wren in Surinam.....*Fr. Haverschmidt*
The Avifauna of the Barstow Miocene of California..... *Loye Miller*
Food Habits of the California Gull in Utah.....*Clifton M. Greenhalgh*
Notes on Mexican Birds from the States of Durango and Zacatecas
J. Dan Webster and *Robert T. Orr*

July-August, 1952

Social Behavior in Nesting Cliff Swallows.....*John T. Emlen, Jr.*
Notes on Plumages, Molts, and Age Variation of the Red Crossbill....*Harrison B. Tordoff*

May-June, 1952

The Incubation Patch of Passerine Birds.....*Robert E. Bailey*
A Nesting of the Double-toothed Kite in Panamá.....*Robert M. Laughlin*
Experiments on the Mating Behavior of the Brewer Blackbird
Thomas R. Howell and *George A. Bartholomew, Jr.*
Reactions of Poor-wills to Light and Temperature.....*Joseph Brauner*
Behavioral and Evolutionary Significance of the Abnormal Growth of Beaks of Birds.....*Wade Fox*
Some Birds of Northwestern Sonora, Mexico.....*Allan R. Phillips* and *Dean Amadon*

March-April, 1952

The Jaws of the Cretaceous Toothed Birds, *Ichthyornis* and *Hesperornis*
Joseph T. Gregory
Auditory Recognition of Predators.....*Loye Miller*
Life History of the Chestnut-tailed Automolus.....*Alexander F. Skutch*
Some Observations on the Birds of Southern Korea.....*Chester M. Fennell*

January-February, 1952

Breeding Behavior of the Brewer Blackbird.....*Laidlaw Williams*
The Vanishing Masked Bobwhite.....*J. Stokley Ligon*
Notes on the Birds of Sledge Island, Bering Sea, Alaska.....*Tom Cade*
The Races of the Bald Starling of the Philippines.....*Kenneth C. Parkes*
Body Temperatures in Nestling Western Gulls
George A. Bartholomew, Jr., and *William R. Dawson*

November-December, 1951

A Field Study of Some Grouping and Dominance Relations in Ring-necked Pheasants.....*Nicholas E. Collias* and *Richard D. Taber*
Territorial Behavior and Age Composition in a Population of Mockingbirds at a Feeding Station.....*Josephine R. Michener*
Mortality Records as Indices of Migration in the Mallard.....*Joseph J. Hickey*